

# The Mining Journal

## RAILWAY AND COMMERCIAL GAZETTE.

FORMING A COMPLETE RECORD OF THE PROCEEDINGS OF ALL PUBLIC COMPANIES.

No. 764.—Vol. XX.]

LONDON, SATURDAY, APRIL 13, 1850.

[PRICE 6D.]

**FOR SALE, BY PUBLIC AUCTION, at the CLARENDON ROOMS, LIVERPOOL, on Wednesday, the 17th of April, 1850, at One o'clock, THREE HUNDRED TONS of SOFT PIG-LEAD, free from slag, in lots of 50 tons each. Apply to Mather & Co., 11, Goree, Liverpool; or Bagillt Lead-Works, Holywell.**

On WEDNESDAY, THURSDAY, FRIDAY, and SATURDAY, April 24, 25, 26, & 27, 1850, To Railway Contractors and Proprietors, Timber Merchants, Builders, Miners, Engineers, Founders, Stone Merchants, Carriers, Brokers, and others.—Very Important Sale of all the Extensive and Valuable Materials, Plant, Timber, Steam-Engines, Boats, Wagons, Trucks, Implements, Tools, Machinery, and other property lately used in the formation and construction of a work of great magnitude and mechanical skill, known as the far-famed Standedge Tunnel, upon the Manchester and Huddersfield Branch of the London and North-Western Railway.

**MR. WHEATLEY KIRK** has the pleasure to announce, that he is honoured with instructions from Thos. Nicholson, Esq., the eminent contractor, who has finished his contract, to **SELL, BY AUCTION**, on Wednesday, Thursday, Friday, and Saturday, April 24th, 25th, 26th, and 27th, 1850, all the valuable

### RAILWAY PLANT, MATERIALS, &c.

used in the CONSTRUCTION and COMPLETION of STANDEDGE TUNNEL, in MARSDEN, and the adjoining RAILWAY WORKS, among which may be named 25-horse power HIGH-PRESSURE STEAM-ENGINES. These engines have all wrought-iron axles, and capable of being made 15 or 20 horse power, with an extra cylinder. No. 1 engine has a 30-horse boiler; Nos. 2, 3, 4, and 5, have two boilers each, 24 ft. long, 6 ft. diameter, and circular ends, all in capital working condition, and nearly new; 12-horse ditto, which has a mortar-mill, double rollers, revolving iron pans, and saw-mill attached thereto, excellent capstan ropes, 3-inch diameter, several flat-ropes, 200 yards long, about 30 tons of light rails, a large quantity of scrap-iron, 15 long narrow boats, and 4 short ditto, all in capital condition, and newly docketed, a large quantity of prop and other timber, 30 centres of 30 ft. span, and 7 ft. 6 in. rise, a large quantity of tunnel and other centres, of various sizes, varying from 4 ft. 6 in. to 12 ft. for culverts, 4 sets of head gear, of the best solid oak, a large quantity of Memel oak and elder timber, also oak suitable for millwrights, round timber, prop wood for collieries and lime works, scantlings, boards, and planks, of 9-inch, 10-inch, 11-inch, and 12-inch, firewood in immense quantities, also a large lot of temporary sleepers, &c., scrap, plate, round, and centre iron, a number of iron ovens, a weighing machine, capable of weighing 9 tons, 3000 yards of conducting or guide rods, of the very best iron, in lengths averaging 20 ft. each, tapped and fitted, &c., wheels, a large crane, with oak shaft, capable of lifting 10 tons, a small ditto, 6 crab windlasses, a very excellent setting crane, 12 wrought-iron beam fire-grates, 12 smiths' anvils, in excellent condition, 200 small waggon, each waggon contains 2 cwt. of the very best wrought-iron, besides the wheels and axles (these have been used for winding the material out of the shafts, and have four bolts to each, looped and screwed right through), 30 turn-tables, framed in American elm timber, each 4 ft. 6 in. diameter, and weighing about 6 cwt. each, a pile engine, with iron ram, 5 capstans, with heart-of-oak shafts, all well hooped, and pedestals of the very best description, a number of folding doors, for the tops of shafts, with balances, axles, &c., a pair of capital pulleys, 6 ft. diameter, and 9-inch opening in coil space, several pairs of 4 ft. 6 in. and other dimensions, a quantity of waggon wheels, 2 ft. 6 in., a capital crane, with new job upright bars up the shaft, &c. In the stores, &c., will be found a quantity of striking hammers, of various sizes, from 7 lbs. to 18 lbs. each, quarry and mining picks, bucking chains, blocks, pulleys, hooks, quarry bars of different sizes, vices, anvils, smiths' hammers, smiths' tools, handles, large beam and scales, weights, fuses, wrought-iron spikes, about 100 tons of new and old pig-iron, oil, clamps, pump, lanterns, a capital 4-wheeled waggon, nearly new, with 6-inch wheels and shavings, double and single shafts, &c., spring-cart in excellent condition, two other carts, excellent whitechapel, gig, harness, bay mare, saddles, bridles, a number of sets of chain and cart-harness, gear, &c., hay choppers, joiners' benches and tools, and an immense collection of other miscellaneous properties and effects.

N.B.—No. 1 steam-engine has a 30-horse boiler attached thereto; and Nos. 2, 3, 4, and 5 have two boilers each, 24 ft. long, 6 ft. diameter, and 9-inch opening in coil space. Fully detailed particulars in catalogues, which are being prepared, and may be had, five days prior to the sale, of the auctioneer, at his offices, 68, Cross-street, King-street, in Manchester; or of Mr. Nicholson, at the works, Marsden, near Huddersfield.

P.S.—The whole of the above valuable effects are lying on the railway, at Marsden and Saddleworth, which is also close to the canal and turnpike-road, which renders it most easy of traffic.

### ORDER OF SALE—VIZ:—

First Day.—Part timber, waggons, smiths' shops, stores, wrought and cast metal, five boats, sleepers, &c.  
Second Day.—Part timber, stores, tools, wrought and cast metal, bay mare, white-chapel, gig, harness, four-wheeled waggon, spring-cart, &c.  
Third Day.—Six boats, turn-tables, heavy implements and machinery, rails, waggons, and remainder of timber, weighing machine, &c.  
Fourth Day.—N.D. This day's sale will commence at the Saddleworth end of the tunnel—consequently, parties coming by rail from Manchester must alight at the Saddleworth Station, and will comprise 5 steam-engines, 25-horse power each, 1 ditto, 12-horse, mortar-mills, engine-houses, sheds, buildings, capstans, guide-rods, &c.  
Fifth Day.—The sale to commence each morning a little after eleven o'clock, in order to give time for the arrival of the trains from Manchester, Huddersfield, Leeds, &c.

**FOR SALE, BY PRIVATE CONTRACT, at WHEAL GREY MINE, in the parish of GERMOL, the following**

### MINING MATERIALS—VIZ:—

One 52-inch STEAM PUMPING-ENGINE, 9 feet stroke by 7 inch shaft; 1 BOILER, 40 feet long, 6 feet case, 4 feet tube; 1 ditto, 35 feet long, 6 feet case, 4 feet tube; 1 ditto, 40 feet long, large end of case 6 feet, small end 5 feet, large end of tube 4 feet, small end 3 feet; 1 10-inch top door-piece; 1 6-foot 16-inch windbox; 1 9-foot 17-inch pole case; 1 4-foot 16-inch matching piece; 6 9-foot 16-inch pumps; 8 9-foot 16-inch ditto; 1 9-foot 17-inch ditto; 1 9-foot 10-inch ditto; 3 6-inch blocks. Roof of tin house; a quantity of bricks, and sundry other materials.

Application to be made to the agent, on the mine; or to Capt. Thomas Richards, Marsden; or to Mr. R. Wellington, Penzance.

The materials will be promptly disposed of, to close the accounts of the mine.

Dated Wheal Grey, March 19, 1850.

**MINERAL PROPERTY.—TO BE DISPOSED OF, a valuable MINERAL PROPERTY, in the centre of the mining district of CARDIGANSHIRE, within 3 miles of the Lisburne Mines. The lodes of the adjacent mines run through the property, which contains upwards of 110 acres, with the right of working minerals on an additional extent of 500 acres beyond that cited as surface, which would be disposed of with the mineral rights. There is ample water-power, and the fee-simple of the soil, with minerals, will be disposed of by the proprietor.—Particulars may be acquired on application to Mr. Henry English, 25, Fleet-street, London.**

A FEW SHARES in a RICH SILVER-LEAD MINE to be DISPOSED OF.—Applications to be made to Mr. Durrant, 55, Lombard-street.

**BLAIR IRON-WORKS.—These extensive IRON-WORKS, with the LEASES of the MINERAL FIELDS, as formerly advertised, will be EXPOSED FOR PUBLIC COMPETITION, on or about the month of APRIL next, if not previously disposed of by private bargain.—In the meantime offers will be received, and information afforded, by Mr. Brown, 35, St. Vincent-place, Glasgow.**

**EAST OF SCOTLAND MALLEABLE IRON COMPANY.**

The Directors have been authorised to RECEIVE OFFERS for the PURCHASE, or LEASE, of the MALLEABLE IRON WORKS at DUNFERMLINE—comprising a STEAM-ENGINE, of 80-horse power, working the machinery, consisting of FORGE and PUDDLE BAR TRAINS, of 16 inch diameter, HAMMER and PATENT SHELLING MACHINE; also a 16-inch MERCHANT BAR or RAIL MILL, a 12-inch MILL, for ordinary sized merchant bars, and an 8-inch GUIDE MILL, 13 PUDDLING FURNACES, and 6 MILL FURNACES—the whole capable of producing 120 tons of bar-iron weekly.

A REFINERY STEAM-ENGINE, of 45-horse power, with blowing apparatus, complete, and two fires erected.

A complete SET of WORKSHOPS, containing a 20-horse power STEAM-ENGINE, driving a powerful roll-turning lathe, and blowing apparatus for smiths' fires.

A PUMPING and CLAY MILL STEAM-ENGINE, of 16-horse power, used for the manufacture of fire-brick, and pumping water for supply of engines.

Also, in course of erection, a STEAM-ENGINE, of 80-horse power, intended to drive the mills apart from the forges, having strong cast-iron framing laid down, and machinery suitable on the premises, which could be brought into active operation in a short period. Together with the necessary TOOLS, LOOSE MACHINERY and STOCKS, of different kinds.

Offers will also be received for the PURCHASE of the ESTATE of TRANSY, consisting of about 107 imperial acres, with elegant MANSION-HOUSE and PLEASURE GROUNDS, situated about half a mile to the east of the town of Dunfermline.

Applications may be made to Mr. Talbot, manager of the works; or to Johnstone, Russell, and Craig, writers, Dunfermline.

Dunfermline, March 18, 1850.

Just published.

**MONEY VERSUS LIFE: A REVIEW of COLLIERY**

CASUALTIES—showing their Cause and Extent—the Futility of Coalowners—the Concealment of Deaths in Mines—the Inaccuracy of Returns by Coroners—the necessity of Government Inspection, more Shaft, and adequate Provision for Widows and Orphans of the Victims to Explosion, &c.—with the means to provide for the same without unjust taxation—also showing the Clemency of Government towards the Coalowners of the North. By C. COLWELL, Southwark.—Price 3s. 6d., in cloth and lettered. Simpkin and Marshall, London.

**THE MINING ALMANACK for 1850: compiled and arranged**

by HENRY ENGLISH, Mining Engineer, &c. Under the special sanction and patronage of H.R.H. PRINCE ALBERT, Lord Warden of the Stannaries, Chief Steward of the Duchy of Cornwall, Devon, &c.—THE SECOND VOLUME will appear early in MAY next, with ADDITIONAL TABLES and STATISTICS, connected with the Mining Interests.—Names of subscribers are requested to be addressed to Mr. H. English, 25, Fleet-street.

**IRON, HARDWARE, AND METAL TRADES' PENSION SOCIETY.**

The SEVENTH ANNIVERSARY FESTIVAL of this INSTITUTION will be held at the ALBION TAVERN, ALDERSGATE-STREET, on Wednesday, April 24, 1850. The Right Hon. LORD VISCOUNT LEWISHAM, M.P., in the Chair.

### STEWARDS.

Wm. Barrows, Esq. V.P. Edw. Ladd Betts, Esq. V.P. W. S. Burton, Esq. V.P. John Brown, Esq. V.P. James Basington, Esq. James Benbow, Esq. Benbow, Esq. Thomas Constable, Esq. John Dale, Esq. V.P. Richard Dale, Esq. Wm. Dickinson, Esq. Jerm. Evans, Esq. Deputy B. Fowler, Esq. V.P. John Faulkner, Esq. Sir J. J. Guest, Bart. M.P. V.P. William Gould, Esq. V.P.	John Grice, Esq. Thomas Hawkins, Esq. V.P. John Harrison, Esq. W. G. Holmer, Esq. Richard Hurst, Esq. Valentine Hurst, Esq. R. W. Kennard, Esq. V.P. and Trustee T. W. Kennard, Esq. V.P. Howard J. Kennard, Esq. William Massey, Esq. W. W. Moore, Esq. G. S. Nottage, Esq. A. G. Pooley, Esq. C. A. Preller, Esq. M. Plow, Esq. D. Pretyman, Esq. Ell Richards, Esq.	Charles Ralph, Esq. Benjamin Ridge, Esq. Joseph Rowan, Esq. R. Stephenson, Esq. M.P. V.P. T. B. Simpson, Esq. V.P. Trustee and Trustee W. Shaw, Esq. George Scannell, Esq. H. L. Taylor, Esq. V.P. and Trustee B. Walmsley, Esq. C. W. Woolorton, Esq. Lynch White, Esq. William Whitley, Esq. B. Willoughby, Esq. D. L. Williams, Esq.
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Dinner on Table at half-past Five for Six precisely.

Tickets, ONE GUINEA each, may be obtained from any of the above-named gentlemen, or on application to Mr. THOMAS HAWKINS, Hon. Sec., 67, Upper Thames-street.

**CARADON VALE MINE, SAINT IVE, NEAR LISKEARD, CORNWALL.**

PURSEY.—Mr. John Stephens, St. Ives, Liskeard; Mr. Charles Collins, Exeter.

BANKERS.—Mr. Sanders, Exeter; the Devon and Cornwall Bank, Exeter and Liskeard. This mine is situated in the parish of SAINT IVE, near LISKEARD, CORNWALL, and was worked upon by several poor experienced miners a short time since, to develop that which they felt convinced existed there—viz., rich copper ore. They drove an adit 70 fms. to hill, and sunk a winze 12 or 15 fms. under that adit to cut the lode, when to their dismay they were completely impeded by the large quantity of water issuing from the lode, they having only water-buckets to draw up the same; sufficient was, however, to know that rich yellow and black copper ore existed against the cross-course. There are seven lodes, well defined, and carrying the most extraordinary quantity that can be seen, with rich peach, prun, felspar, and ore, and every other qualification to convince miners that great riches exist beneath.

It is proposed that the mine be divided into 1536 shares, at FIVE SHILLINGS PER SHARE, being the first deposit, and the liability of each shareholder is not likely to exceed £4 per share, as it is not expected more than £1 per share will be required. The calls, too, are moderately fixed, not to exceed 6s. per share every two months.

A large number of the shares are already taken up. Application for the remainder may be made to Mr. Thomas Sanford, Exeter; Mr. John Stephens, St. Ives, Liskeard; Mr. Edward Suter, Exeter; Mr. James Timewell, Exeter; Mr. John Seymour, St. Cleer, Liskeard; and Mr. Henry Vatcher, Exeter.

### CARADON VALE MINE.

Agreeably with your request, I have inspected the above mine, and report as follows:—A cross-cut adit has been driven northward from its mouth, 50 fathoms, where a very promising lode is cut, averaging from 1 to 2 and 3 feet wide. The lode is composed of green, spar, peach, iron pyrites, with stains of carbonate of copper, located in a beautiful kila strata, at a little distance from the granite range of Caradon, and is bounded on the west by Ikenbury, and on the south by South Caradon Mines. The lode is one of great promise, and its situation most favourable; and, on the whole, I judge this adventure to be every way worthy the attention of mining capitalists. ROBERT DUNSTAN.

West Caradon, Feb. 26, 1850.

**CARADON VALE MINE.—Notice is hereby given, that NO FURTHER APPLICATIONS FOR SHARES will be received after Thursday, the 25th day of APRIL instant.**

CHARLES COLLINS, Purser.

Exeter, April 4, 1850.

**DRAKE WALLS MINES COMPANY.—At the Annual**

General Meeting of the shareholders in this Company, held this day,

PETER STAINSBY, Esq., in the chair.

The following resolutions were passed unanimously:—

Resolved.—That the reports and accounts now read be received, adopted, and entered in the Company's Cost and Transfer Book.—Carried unanimously.

Resolved.—That the best thanks of this meeting are due, and are hereby given, to the Chairman, for his very able management of the affairs of the Company.—Carried unanimously.

Resolved.—That the cordial thanks of this meeting be, and are hereby given, to Mr. P. E. HODGKINSON, for his energetic management of the Company's property.—Carried unanimously.

Resolved.—That to liquidate the balance against the adventurers, it is recommended that the Committee make a call of 10s. per share.—Carried unanimously.

**LAMEROOEE WHEAL MARIA.—A Special General Meeting**

of adventurers in this mine, convened by the Purser, was held at the offices, No. 4, King-street, on Thursday, the 11th of April, 1850.

PETER DAVEY, Esq., in the chair.

The following resolution was passed unanimously:—

That an additional, or extra, call be now made of £1 per share—10s. of which is to be paid before the 20th of April inst., and the remaining 10s. to be called at the discretion of the committee.

JAMES CROFTS, Secretary.

**TINCROFT MINING COMPANY.—At the Annual General**

Meeting of the shareholders in this Company, held this day,

RICHARD HODGSON, Esq., in the chair.

The following resolutions were passed unanimously:—

That the reports and accounts now submitted be received, adopted, and entered in the Company's minute-book.

That the thanks of this meeting be presented to the Chairman and Directors, for their judicious, careful, and successful management of the Company's property, as evidenced in the propitious condition of all departments of the mine.

That the thanks of the shareholders are due, and are hereby presented, to Capt. Floyd, for his able and energetic management of the mines, and for his careful attention to the interest of the shareholders.

Salvador House, April 10, 1850.

**WHEAL CREBOR, in 1024 Shares.**

### COMMITTEE OF MANAGEMENT.

G. E. HODGKINSON, Esq., Director of the Australian, and Chairman of the Worthing Mining Company.

R. HALLETT, Jun., Esq., Deputy Chairman of the Worthing Mining Company.

C. HANCOCK, Esq., 30, Tottenham-yard.

JOHN HUNDLE, Esq., banker, Tavistock.

JOSEPH THOMPSON, Esq., 43, Gloucester-terrace, Hyde-park.

At a Meeting, held at No. 76, Cornhill, on Saturday, the 6th day of April inst.,

G. E. HODGKINSON, Esq., in the chair.

Present.—Messrs. D. Hallett, R. Hallett, Jun., G. E. Hodgkinson, C. Hancock, W. Vivian, H. Molyneux, A. Dean, A. Murray, Jun., C. Hancock, S. Hooper, and J. H. Murchison, the following resolutions were passed unanimously.

1. That a Company be now formed on the Cost-book System, for the purpose of working the copper lodes in Old Crebor set, and in the new grant of land belonging to the Rev. Mr. Beaumont, adjoining the western boundary of the former, and that such Company be formed on the terms announced in the prospectus.

2. That the rules now read be the Cost-book Rules on which the Company shall be conducted.

3. That Messrs. Hodgkinson, Hallett, Hancock, and Rundle, be the managing committee, with power to appoint one other; and that they instruct Mr. C. Hancock to take the necessary steps for transferring the leases, and doing any other legal business required; and that on the completion of these they commence operations on the plan suggested by Messrs. Wolferstan and Murray, or such other as may be deemed advisable by the Committee.

4. That Mr. J. H. Murchison be the secretary.

5. That Mr. J. Matthews, of Tavistock, be appointed the purser, and Captain William Doble, the captain at the mine; and that the remuneration to those officers be left to the Committee to arrange.

6. That a call of 10s. per share be now made, payable at the bankers of the Company, on or before the 20th inst.

7. That Messrs. Matthews and Co., and the Tavistock Bank, be requested to be the bankers of the Company.

8. That the Committee of Management be authorised to arrange for offices, pro tem, for the company, and that they be at the Worthing Mining Company's offices, 76, Cornhill.

**THE KEY TO RAILWAY INVESTMENTS, with a MAP.**

By JOHN WHITEHEAD.

Of the Stock Exchange, London. Author of "Railway and Government Guarantees," &c.

Part I.—The Great Western Railway; and

Part II.—The London and Brighton Railway, are now ready.

Part III.—The South-Western Railway, on the 19th April.

To be had of the author, No. 9, Royal Exchange-buildings, London; and Weale, 59, High Holborn.—Price 1s. 6d. each part.

**PARSEY'S COMPRESSED AIR-ENGINES.**—Where furnaces are dangerous and objectionable underground, these ENGINES would be of great advantage in PUMPING and MINING PURPOSES, as the power can be produced on the surface, and sent down by small pipes to do the work, whenever it may be convenient. As the machine below blows off atmospheric air, instead of steam, the ventilation produced thereby would clear away foul air. Applications to be made to Mr. Parsey, No. 455, Oxford-street, London.

**TO CAPITALISTS.—WANTED, a SLEEPING PARTNER,** able to advance £5000 to £1000, for the purpose of DEVELOPING an important MINERAL PROPERTY, from which immediate and handsome returns may be expected. The present partners are of the highest standing, and the above presents an unusually eligible opportunity for the investment of capital. None but parties of the most undoubted respectability, or their solicitors, will be treated with. Letters, addressed "X. Y. Z.," care of the Housekeeper, Old Jewry Chambers, will meet with due attention.

**TO METAL BROKERS.—A YOUNG MAN** is desirous of PLACING HIMSELF in the OFFICE of a METAL BROKER for TWO YEARS, and for which a Premium will be given.—Address "A. B.," at Mrs. Titterton's, stationer, George-yard, Lombard-street.

**ZINC WORKS.—A PERSON,** thoroughly acquainted with the mode of Manufacturing Zinc from Blende and Calamine, wishes to obtain a permanent SITUATION as FOREMAN of the WORKS in a ZINC MANUFACTORY. He has no objection to reside either on the continent or America, and can be well recommended.—Applications to be addressed "A. B. C.," at the office of the Mining Journal, 26, Fleet-street, London.

**SULPHATE OF BARYTES.—PERSONS** disposed to SUPPLY the ABOVE ARTICLE in REGULAR QUANTITIES per month, in its natural state, to be delivered free on board at the nearest port, are requested to SEND TERMS, as to quantity and price, addressed to "A. B.," at Messrs. Coode, Browne, and Kingdon, 13, Bedford-row.—The barytes may be delivered stained or discoloured.

**FOR SALE.—WHITE or BELL METAL,** of the best English make.—Samples may be seen, and further particulars had, of Messrs. Cotton and Truman, 1, Royal Exchange Buildings, City.

**WANTED TO PURCHASE, a QUANTITY OF MUNDIC** or PYRITES.—Apply by letter, stating lowest price delivered at Birmingham, to Box 59, Post-office, Birmingham.

**STEAM-ENGINES.—TO BE SOLD, 1 6-horse, 1 12-horse,** and 1 16-horse HIGH-PRESSURE ENGINES, on the horizontal construction—very strongly made.—Apply to John Ellis, Jun., and Brothers, Vener Saw-Mill, Backwater-street, Manchester.

**SPARE MATERIALS FOR SALE, BY PRIVATE CONTRACT,** at the PROVIDENCE MINES, near ST. IVES.—A 30-inch cylinder PUMPING ENGINE, with BOILER, complete; 9-inch Pumps, Plunger-case, Matching-pieces, Working Barrels, and Windboxes.—Apply to Capt. Dunstan, at the mines, or to Mr. Samuel Higga, Penzance.—April 8, 1850.

**MINERAL BLACK.—TWO SETTS TO BE GRANTED** to a substantial PROPRIETARY, situated within 9 miles of water carriage, on the RIVER TAMAR, CORNWALL, with unusual facilities for working the same. For samples, and further particulars, apply to Mr. C. L. Radcliffe, solicitor, Plymouth.

**MINING SETT.—Any PERSON** desirous of ENGAGING in a MINING SETT, in which FOUR LODES have BEEN OPENED, of first-rate appearance, are requested to apply to Mr. Richard Hooper, Bodmin.

**MINING OFFICES, 3, GEORGE-YARD, LOMBARD-STREET, LONDON.**—Mr. T. P. THOMAS is a BUYER of SHARES in Wheal Seton, North Pool, South Wheal Frances, Trelawny, Wheal Elizabeth, Cwm Erfin, Levaunt, Court Grange, Lisburne Mines, and Santiago; and is a SELLER in Alfred Consols, Bedford, Penzance Consols, Penzance Consols, East Gwinn Lake, East Buller, Gustarus Mines, Strete Park, Tolarne, Kingstons and Bodford, South Tolgus, Trevisey and Barrior, South Bassett, Tincroft, West Wheal Treasury, Wheal Comfort, Wheal Mary Ann, Wheal Margaret, and South Trelawny.

T. P. THOMAS is generally in a position to BUY and SELL at close MARKET PRICES, and will be happy to afford information upon application.

N.B.—MINES INSPECTED.

**MINING PROPERTY.—Mr. HERON** has SHARES in the best DIVIDEND MINES FOR SALE, and which will give to the purchaser 17 to 25 per cent. for the outlay; amongst others are the following:—Trevakey and Barrior, Wheal Trelawny, Tremayne, Tincroft, East Wheal Rose, Great Devon Consols, West Providence, West Caradon, United Mines, Wheal Margaret, Condorow, Carn Brea, West Treasury, Bedford, Mary Ann, South Tolgus, North Pool, and Santiago Mines.—Mining Offices, 33, Clements-lane, Lombard-street.

**MR. T. A. READWIN, MINING OFFICES,**

2, WINCHESTER-BUILDINGS, OLD BROAD-STREET, LONDON.

**MR. C. S. RICHARDSON, CIVIL ENGINEER, LAND**

AND MINING SURVEYOR.

No. 15, OLD BROAD-STREET, LONDON.

**MR. GEORGE BATE, JUN., CIVIL ENGINEER AND**

SURVEYOR.

WOLVERHAMPTON.

Offices in Queen-street, corner of Piper's-row.

N.B.—UNDERGROUND MINING SURVEYS accurately executed.

**JAMES LANE, MINING SHARE DEALER,**

80, OLD BROAD-STREET, LONDON.

**BODMIN CONSOLS, WHEAL BRAY, ASHBURTON**

UNITED, and WHIDDON.—The LONDON OFFICES for these MINES are at

No. 2, ROYAL EXCHANGE BUILDINGS.

WM. MURRAY, Secretary.

**ASTURIAN MINING COMPANY.—Notice is hereby given,**

that, at the adjournment of the General Meeting of this Company, held on the 26th March ult., and which ADJOURNMENT has been appointed for the 16th of April inst., at One o'clock. The admission will be limited to those who are duly qualified to appear and vote thereat, pursuant to the notice convening the said original meeting (see Times, Daily News, and Mining Journal, of the 2d March last), in accordance with the statutes of the Company.

By order of the Board.

CHARLES CUNINGHAM, Chairman pro tem.

9, Austinfriars, London, April 12, 1850.

**ASTURIAN MINING COMPANY.—IN LIQUIDATION.**

—Notice is hereby given, that the MONTHLY BALANCE-SHEET of the Company, to the 28th of February last, prepared subject to the pending investigation, is now in COURSE OF DISTRIBUTION. The abstracts of the accounts remain at the Company's offices at Mieres and in London for inspection.

By order of the Board of Directors and Liquidators.

9, Austinfriars, London, April 9, 1850.

K. MACKENZIE, Secretary.

**BLAENAVON IRON AND COAL COMPANY.—Notice**

is hereby given, that the ANNUAL GENERAL MEETING of the Shareholders of this Company will be HELD at their offices, Paneras-lane, London, on Friday, the 26th of April next, at One o'clock precisely, when the accounts and transactions of the past year will be laid before them.

By order of the Board.

Offices, 4, Paneras-lane, London, March 28, 1850.



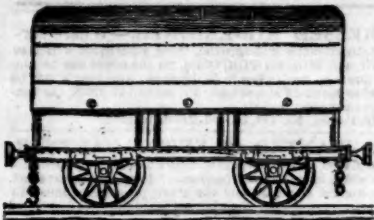
BY HER MAJESTY'S ROYAL LETTERS PATENT.  
IMPORTANT TO RAILWAY COMPANIES, CARRIERS, AND OTHERS.

## ROWLAND BROTHERHOOD'S TILT, FOR COVERING RAILWAY TRUCKS, WAGGONS, &c.

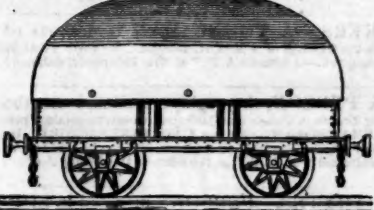
This invention allows of trucks or wagons being covered or uncovered with surprising ease and facility, so that one porter can uncover two trucks in the space of a minute, and two can re-cover both in the same time. It allows of a small portion, or the whole area of the truck, being uncovered, and affords great facility for loading and unloading, and protecting the goods in these operations, as well as in the course of transit. It can be secured by locks and keys, thus rendering merchandise secure from plunder. It is cheap in its construction, can be applied to railway trucks and wagons generally, and is easily attached or detached. It runs smoothly through the air at high speeds, and against head winds.

This Tilt has been in use on different parts of the broad gauge during the winter, and has been found to work remarkably well in the severest weather. Experienced and practical persons, who have the management of large goods stations, and have seen these tilts in working, and who know the great wear and tear of cloths, tarpaulins, &c., and the inconvenience of existing modes for goods covering, are of opinion that these tilts will be of great utility in railway service. The patentee is himself prepared either to construct or, on moderate terms, to license parties to construct his patent tilts.

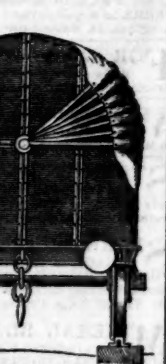
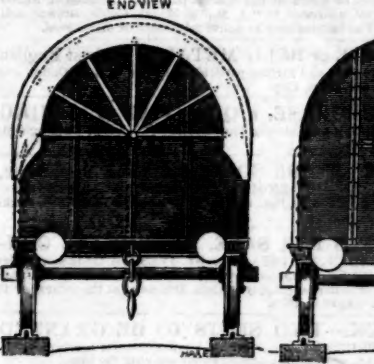
Applications to be addressed to R. Brotherhood, Railway-Works, Chippenham, Wilts.



No. 1.  
This shows the side elevation of a wagon, with the tilt closed and fastened down.



No. 2.  
This shows the tilt as applied to a box wagon, or long-sided truck, with longitudinal bearers.



No. 3.  
This is an end elevation of the same on a larger scale, showing the pin and fan which supports and carries over the longitudinal bearers to which the cloth is attached, and which when open lies compactly folded along the side of the truck, leaving the whole area of the truck open for receiving or discharging its contents by crane or otherwise.  
The tilt is applied to box, or low-sided trucks, with curved longitudinal bearers.

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PART THE FIRST treats of the anatomy and physiology of the reproductive organs, and is illustrated by six coloured engravings.—PART THE SECOND treats of the consequences resulting from excessive indulgence, and their lamentable effects on the system, producing mental and bodily weakness, nervous excitement, and generative incapacity; it is illustrated by three explanatory engravings.—PART THE THIRD treats of the diseases resulting from infection, either in the primary or secondary form, and contains explicit directions for their treatment. This section is illustrated by 17 coloured engravings.—PART THE FOURTH contains a remedy for the prevention of disease by a simple application, by which the danger of infection is obviated. The important part of the work should not escape the reader's notice.—PART THE FIFTH is devoted to the consideration of marriage and its duties. The causes of unproductive unions are also considered, and the whole subject critically and philosophically inquired into.

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## Transactions of Scientific Bodies.

### MEETINGS DURING THE ENSUING WEEK.

THIS DAY	Royal Botanic—Inner Circle, Regent's Park	8 P.M.
MONDAY	Chemical—142, Strand	8 P.M.
	Pathological—21, Regent-street, Waterloo-place	8 P.M.
TUESDAY	Linnæan—Soho-square	8 P.M.
	Horticultural—21, Regent-street	8 P.M.
	Civil Engineers—25, Great George-street	8 P.M.
WEDNESDAY	Society of Arts—Adelphi-street	8 P.M.
	Microscopical—21, Regent-street	7 P.M.
THURSDAY	Royal—Somerset-house	8 P.M.
	Antiquaries—Somerset-house	8 P.M.
FRIDAY	Royal Institution—Albemarle-street	8 P.M.
SATURDAY	Academy—5, New Burlington-street	2 P.M.

### INSTITUTION OF CIVIL ENGINEERS.

APRIL 9.—WILLIAM CURRIE, Esq. (President), in the Chair.

The paper read was "On the Construction of Locks and Keys," by Mr. J. Chubb, Assoc. Inst. C. E. The author commenced by stating, that the most ancient lock, of whose form and construction there was any certain knowledge, was the Egyptian, which had been in use for upwards of 4000 years. The construction of this lock was minutely described, also that of the ancient "warded" and "letter" locks, and considerable antiquarian research was displayed in tracing their origin and introduction. These three kinds of locks were, in principle, the foundation of all modern locks, which might be thus enumerated, reversed, for obvious reasons, in their order of antiquity:—

1. The letter locks; mostly used for padlocks, and were so far convenient, as a key was not required for opening them. A modification of this lock had been proposed, called the "scutehon" lock, for securing doors and iron safes, but it was too expensive and complicated to come into general use.

2. Locks having fixed wards, in which no real improvement had been made in modern times. These locks were bad in principle, as they could be easily picked; and owing to many thousands of them being yearly made, that could be passed by the same key, little or no security was afforded by them; in fact, it might be safely asserted, that 20 skeleton keys would open all the locks, of a given size, made upon this principle.

3. The Egyptian lock; the essential principle of which was, that of moveable pins, or studs dropping into, and securing the bolt, all of which must be raised to the proper height, by corresponding pins in the end of the key, before the bolt could be unfastened. This lock was the foundation upon which most of the ingenious inventions of late years had been based, differing only in the forms of the moveable obstructions to the bolt, some of which acted vertically, others horizontally, some with a rotatory motion, and many others in an endless variety of ways; but of all these it was thought sufficient to describe only those best known and appreciated—viz.: Barron's, Bramah's, and Chubb's.

In Barron's lock, patented in the year 1774, a great improvement was made upon the ancient Egyptian, by the introduction of the over-lift, wards being also used; but, from the fact of there being only two tumblers, it was evident, that no great change, or permutation could be made in the combinations.

In Bramah's lock, patented in the year 1784, there was a compound of both direct and rotatory motion given to the key, instead of simply the latter, as in Barron's lock. It consisted of a number of sliders, having notches, of various depths, cut on one edge, so that the motion of the bolt was totally prevented, until each slider was pressed down to its exact depth, which was effected by the key having six cuts in it of different lengths.

In Chubb's lock, first patented in 1818, and since modified and improved by various subsequent patents, there were six separate and distinct tumblers, placed over each other, and capable of being elevated to different heights, but all moving on the centre pin. This lock differed from the others, in having a "detector," by which any attempt to pick, or open the lock with a false key, was immediately notified, on the next application of its own key.

Calculations were then gone into to show the number of different combinations which might be made in this lock, and it appeared, that with an average sized key, having six steps, each capable of being reduced in height 20 times, the number of changes would be 86,400; that if the seventh step, which threw the bolt, was taken into account, the reduction of it only 10 times, would increase the number to 864,000. Further, that as the drill pins of the locks, and the pipes of the keys, might be made of three different sizes, the total number of changes would be 2,592,000. In keys of the smallest size, the total number would be 648,000, whilst in those of the largest size it would be increased to 7,776,000 changes. In conclusion, it was stated, that the manufacture of locks and keys was principally carried on at Wolverhampton and the adjacent towns, Birmingham and London, and that the fundamental principle upon which all locks should be made, were perfect security; strength, so as to resist attempts to force them, or of opening by picklocks, and false keys; simplicity in the arrangement, so that any stranger, having the proper key, might be able to open the lock; and durability.

The paper was illustrated by a series of diagrams, and a variety of specimens of the locks and keys noticed in the paper; and also by a number of Gothic locks and keys of very elaborate workmanship, suitable for ecclesiastical buildings, &c., from Mr. Chubb's works, in London.

In the discussion which ensued, many additions were made to the historical part of the subject, and various ingenious contrivances were described, which had been successfully applied, to give increased security to locks of ordinary construction. The combinations in the locks of Sumnerford and McKinnon (of New York) were also fully described; an advantage being claimed for the former, in making one tumbler to lift and the other to fall, in order to open it; and, for the latter, that, by the addition of a certain case-hardened iron, three-quarters of an inch in thickness, radiating from the centre of the pin, and a radiating key, there were no means of reaching the tumblers, for the purpose of taking an impression, or otherwise, except by cutting through that curtain. On the other hand, it was positively asserted, that no impression could be taken of, or means invented for picking, a lock which had six tumblers, although it could be easily done, with locks having fixed wards; further, that Chubb's lock was a decided improvement on all others of the same character, inasmuch as it possessed a "detector," which formed really the peculiar feature of that lock; the excellence of the workmanship tended also to the facility of action and consequent durability, for which it was so celebrated.

The discussion upon this paper was announced to be resumed at the next meeting of Tuesday, April 16, when the following would be read, "Description of the Insistent Pontoon Bridge, erected on the Midland Great Western Railway of Ireland, at Dublin," by Mr. R. Mallet, M. Inst. C. E.

**ASHBURNTON AND SOUTH DEVON GEOLOGICAL AND MINERALOGICAL SOCIETY.**—A meeting of the council will take place on Monday next. We are informed that, among the presents already forwarded to the society for their Museum, are 134 specimens from Dr. Croker, of Bovey Tracey, illustrative of Devon geology and mineralogy; and several from Messrs. Robins, Creagh, Herron, and Falk. Professor Tennant, of King's College, has also presented the society with a print of a rare and beautiful fossil.

### LITERARY NOTICES.

**The Key to Railway Investments—Part I.—The Great Western Railway.** Illustrated by a Map of the District.—By JOHN WHITEHEAD, of the Stock Exchange, London, author of "Railway Guarantee," &c. London: J. Weale, High Holborn.

This is the first part of a work intended to exhibit, in a clear and undisguised manner the financial statements which were issued by the several companies in the year 1848, memorable for the "making-things-comfortable" mania, *à la* Hudson, by "cooking" accounts, with their present position (financial and working) and their future prospects. Mr. Whitehead has commenced with the Great Western, which, we have no doubt, is a faithful exposé of their present position, and will be followed up by other lines, published with as much rapidity as they can be; each line accompanied by a large map of the district it traverses—the railway distinguished by a bright red line. The author states, that the scheme suggested itself in the autumn of 1848; but on the appearance of the celebrated "financial statements" he laid it aside—an inspection of these documents satisfying him they had been prepared from incomplete or partial data. He believes, however, directors have found out that "honesty is the best policy," even in railway accounts; that the accounts exhibited at recent meetings may be taken as nearly true, and that he has, therefore, felt justified in doing in 1850, that which in 1848 he dared not attempt. From the details of the Great Western Company's financial position, we find that the entire maximum capital is to be 17,300,000*l.*, of which that already subscribed is—

Unprivileged capital	£2,100,000
Berks and Hants 5 per cents	60,000
Mortgage capital	3,251,984
Subscription bonds	1,500,000

Leaving a balance to be raised of 4,328,316*l.*, of which 1,415,000*l.* has to be raised on the Great Western; Birmingham and Oxford; Birmingham, Wolverhampton, and Dudley; and Wilt, Somerset, and Weymouth shares, and the remainder under the borrowing powers of the several Acts of Parliament. From the author's investigation, taking into account the results of opening up the South Wales district, and every contingency from unprofitable branches, it appears that the receipts must fall very considerably below the present earnings, and 95*l.* miles of guaranteed lines become utterly unproductive, before the holders of unprivileged stock need entertain any fears for their dividends.

**The Foreign Debt of Mexico: being the Report of a Special Mission to that State, undertaken on behalf of the Bondholders.** By W. P. ROBERTSON. London: Smith, Elder, and Co., Cornhill, 1850.

This is a report, with the entire correspondence between the British and American authorities, of the mission undertaken by Mr. Robertson, on behalf of the bondholders, with full details of his progress, with the results which had eventually been obtained. The question is one, undoubtedly, of great importance to British interests, as Mr. Robertson informs us, that while the actual debt of Mexico to her foreign bondholders, amounts, with arrears of overdue dividends, to not much short of 12,000,000*l.*; it scarcely represents at this time an effective value of 3,000,000*l.*—thus leaving an apparent loss to the present bondholders, should they wish to realise their property of 9,000,000*l.* sterling. The volume extends over 66 pages, enters minutely into all the details of past attempts at satisfactory arrangement, and the present prospects of future results; and, to all those who are interested in the question, particularly in a pecuniary point of view, the volume must prove interesting and instructive.

## Proceedings of Public Companies.

### MEETINGS DURING THE ENSUING WEEK.

MONDAY	Kingzett and Bedford Mining Company—Half Moon, Exeter, at Twelve.
	Southwark and Vauxhall Water Company—offices, at One.
TUESDAY	Astorian Mining Company—offices, at One.
	General Steam Navigation Company—offices, at Two.
	Licensed Victuallers' & General Fire & Life Assurance Co.—offices, Two.
	Grand Surrey Docks and Canal Company—offices, at Eleven.
WEDNESDAY	Rhymney Iron Company—offices, at Two.
	Independent Gas-Light and Coke Company—London Tavern, Twelve.
THURSDAY	Ionian Bank Company—offices, One.
FRIDAY	Mentor Life Assurance Company—offices, at Twelve.
SATURDAY	Kinsburgh Mining Company—offices, at One.
	Claridge's Patent Asphalte of Sessel Company—offices, Two.

[The meetings of Mining Companies are inserted among the Mining Intelligence.]

### SCOTTISH AMICABLE LIFE ASSURANCE SOCIETY.

At the annual meeting of the members of this society, held at the offices in Buchanan-street, Glasgow, the Rev. Dr. BARR in the chair, the report of the directors was read, which stated that the amount of claims last year was in larger proportion to the sums insured than the society had yet experienced. This was attributable to that mysterious and fatal malady which had again passed over the world; yet, notwithstanding the great mortality, the claims were only about two-thirds the amount according to the tables. The directors congratulated the members on the security afforded by the rates. The Act of Parliament for the incorporation of the society had been obtained, and was expected greatly to extend its business, and give considerable facilities for conducting it. They had for a long time considered of the propriety of extending their business, by opening an office in London, which was determined on; and Mr. Koch had been appointed secretary in London, a gentleman well fitted for the situation. The business up to the time of the meeting had been highly satisfactory. The Act obtained by the society had enabled the committee to instruct the manager to prepare tables for some classes of insurers, to which the former rates were inapplicable; and it would be desirable to adopt any improvements which the advancement of the science, or well regulated experience, might point out.

Prof. RAMSAY begged leave to move, in terms of the recommendation of the General Committee, that W. Crawford and Elias Gibb be appointed ordinary directors, in room of the retiring members; that the Duke of Athole be appointed a vice-president, in room of Sir Charles D. Ferguson; and that the vacancies among the extraordinary directors be filled up by the appointment of the Dean of the Faculty of Advocates, Dr. Morgan, of Belfast, and Wm. Ewing, of Arngemery. He believed it was almost unnecessary for him to make any observations on this motion.

The Rev. A. J. D. D'ORSEY seconded the resolution—carried unanimously. Dr. BARR conveyed to Mr. Koch the thanks of the society for his very efficient services, in the most complimentary terms.

Mr. KOCH said, the success of the London office had not been the fruit of his individual exertions, but resulted from the combined efforts made by the gentlemen he had recommended to be appointed to co-operate with him as officers of the society. In London they had great opposition to contend with, but still he had no hesitation in saying that, so far as it depended on his exertions and those of the gentlemen associated with him, their success, if not equal to the sanguine expectations formed from the statement he had read, would still be such as always to remunerate the establishment of the office, and bear out all the directors had stated respecting it. He returned them his most sincere thanks for the kind manner in which they had received him.

A vote of thanks was passed to Mr. Spens, the manager, and also to the medical adviser, Dr. Gibbs, when the acknowledgments of the meeting having been voted to the chairman, the proceedings terminated.

**BRIGHTON, LEWES, AND TONBRIDGE WELLS RAILWAY.**—On Monday last, a question of considerable importance in connection with the final settlement of this company's affairs, and involving the liability of a large number of shareholders, came on before Master Sir W. Horne. Mr. Daniel appeared for Mr. Norris, official manager to the estate, and his solicitor, Mr. James; and Mr. Southgate, Mr. Tyrell, and other counsel for shareholders. Lord Alfred Hervey, M.P., who acted as chairman of the company, was present; and the evidence adduced, which extended over some hours, was curiously illustrative of the style in which the business of these concerns was carried on. It appeared that 17,000 shares were to be the maximum of the original allotment, but that, without authority, this was in the first instance exceeded by the issue of 8000 shares more; and subsequently a Mr. Potter, one of the allotment committee, single-handed, allotted 8000 by himself. No scrip for these 8000 was now forthcoming, and the official manager reports that on applying to the parties said to possess it, their reply is that they have none. The scrip certificates, too, consisting of 33 large sized registers, though asserted by Nalder, the secretary, to have been delivered under lock and key to the required custody, were not forthcoming. The secretary said that he duly delivered them with other papers in a strong box to the clerk of the solicitor, though without taking the receipt; and the clerk to the solicitor declares on affidavit his impression that there were no certificates in the box. No distinction was made in the issue of original scrip from that issued in excess, but it was done by the directors indiscriminately. There was no rule requiring more than one member to make an allotment, and Mr. Potter, who had been summoned to attend yesterday, could not be found. In starting railway companies at the period, the order to the printer was "print enough," and accordingly 60,000 blank scrip certificates, with only 30,000 used, were struck off, and these blanks were frequently "ready signed" by the directors. Mr. Daniel contended that the allotment by Potter was binding on the shareholders, and counsel on the other side that it was illegal. His honor, the Master said, the whole was an extraordinary transaction. No doubt there were gentlemen of honour and character connected with the concern, but he felt it was a matter to be sifted, so that the apparent complexity might be cleared up. It was absurd to imagine that documents of this importance and bulk could have been lost or mislaid, and as the production of them, as well as the presence of Potter, was indispensable, he should issue warrants for the purpose.

**DIRECT EXETER, PLYMOUTH, AND DEVONPORT RAILWAY.**—On Wednesday Master Sir C. W. Horne finally, with some few exceptions, settled the list of shareholders, in number 735; liable to be called on to defray liabilities. Sunday individuals were returned as gone to California and Australia, and as having revoked their application for shares before the allotment was struck off; while others who had paid 3*s.* per share, in the expectation that they would be relieved from all future liability, were retained on the list, the Master being of opinion that, in point of law, he could not exonerate them, though the amount they had paid would be placed to their credit, to be deducted from the general call to be made on the shareholders, which, as far as at present calculated, will amount to about 5*s.* per share.

**DIRECT WEST-END AND CROYDON.**—On Thursday the alleged liability of the members of the provisional committee of this company was argued before Master Tinnay at considerable length; Mr. Selwyn, on behalf of Mr. Alderman Hooper, contending that that gentleman and others consented to have their names on the prospectus, on the understanding that they were not to be held liable for debts, and that he never received a share or signed the deed of settlement. Mr. Rogers, on the part of the estate, replied that the alderman had written a letter to the secretary, stating it was agreeable to him to act; that he acted as a referee in the case of parties applying for shares, and signed the letters "member of the committee;" that as a member he had paid 7*l.* to get rid of liability, and, as it was asserted, "for the sake of peace;" and that his name was publicly associated with the purpose of a trading association. As no document in proof of a direct consent to act, considered sufficient to fix with liability the other members of the committee, could be produced in the case of Mr. Alderman Hooper, the Master took time to consider.

**RUGBY, WARWICK, AND WORCESTER RAILWAY.**—On Thursday, in the settlement of this company's affairs, before Master Richards, two important decisions were come to, in dealing with the cases of a large number of transferees of shares, who had received back 15*s.* per share out of the 2*l.* 2*s.* deposit, for which the original shareholders had paid and signed the deed. His Honor the Master held that all parties in the position of bankers and stockbrokers, who had received back dividend from a railway company winding up its own affairs, simply in the capacity of agents, and not having any beneficial interest in the shares, were not to be held liable as contributors under the Act, but that their respective principals, whether in the capacity of original allottees, or as transferees, were to be; also, that a person being either a mortgagee or a depositor, or having a beneficial interest in a share himself, although not an original allottee, was a contributor under the Act. It was contended that, as the instruments transferring the shares were not stamped, it was not a valid conveyance, and that the party or parties were not liable, but the Master overruled the objection. Mr. Daniel appeared for Mr. Wryghte, the official manager; and Mr. Vallance, solicitor to the estate, and Mr. James, Mr. Roxburgh, and Mr. Foulkes, for other parties. The official manager reports the assets at about 3000*l.*, in the hands of the Accountant-General; and the liabilities at about 5000*l.* and 6000*l.* The Northamptonshire Banking Company claim 3000*l.*; the secretary, Mr. Waller, 1000*l.*; and the solicitor, 500*l.* The chairman of the company, was Sir H. G. Ward, now Lord High Commissioner of the Ionian Islands. About 20,000 shares were allotted, and 40,000 received from shareholders as deposit; 5600 shares were bought up by the directors, at a premium, in the market, and 9000 shares were reserved in their own hands; it is said, for landowners. The 40,000*l.* was spent in "preliminaries," leaving a balance in hand of 22*l.*

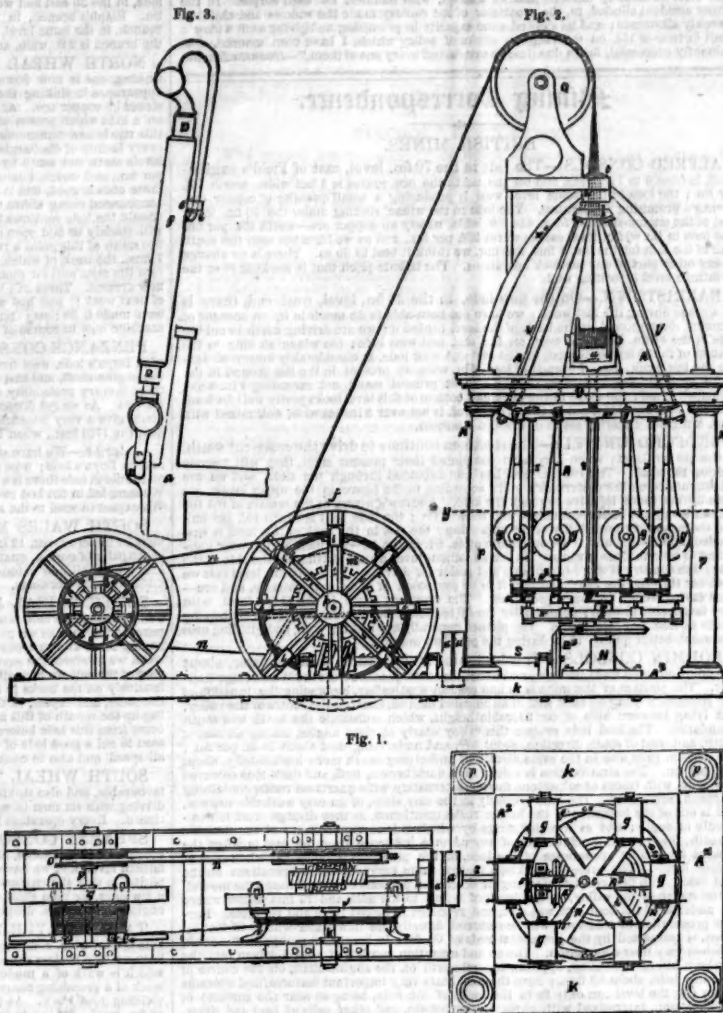
**LONDON AND NORWICH DIRECT RAILWAY.**—Petitions have been presented from the shareholders to have the affairs of this company investigated and wound up.



## MR. ANDREW SMITH'S PATENT WIRE ROPE MACHINERY.

In the *Mining Journal* of 28th July last we inserted a description, illustrated by a diagram, of Mr. Andrew Smith's improved method of obtaining complete combustion of fuel, and the entire avoidance of smoke, at the engine of Messrs. Wilkins and Weatherly, Patent Wire Rope Works, High-street, Wapping, and also an improved method of generating steam. The machinery by which so intractable a material as iron wire, when compared with hemp, is spun into a rope at these works is most simple and complete, and has been patented by Mr. Smith. As the drums on which the wire is wound deliver it to the spinning portion of the machinery, the rope, beautifully and regularly finished, is seen flying away with inconceivable rapidity, and the harmony, smoothness, and freedom from jar or strain with which the whole works is truly admirable. The motion is entirely new for such a purpose, being without wheels, and is effected by a mechanical arrangement similar to an orrery, or the sun and planet motion; it effects great economy in working cost from the decreased friction, takes up much less space than the ordinary machines, and makes but little noise when in most rapid operation. The following is the specification and description:—

Firstly, my invention, in so far as it regards machinery for, or methods of, manufacturing rope or cordage has relation to the means employed to give motion to the reels or bobbins in laying the yarn or wire into strands, or in laying strands into rope or cordage, and consists in the improved arrangements for that purpose represented in figs. 1 and 2, the former of which is a plan of the machinery on the line *xy*, and the latter a side elevation thereof. The bobbins or reels, *gg* (of any convenient number) are mounted in a circular frame, *A*, which is upheld by screw-ropes, *vv*, with an outer framework, *A'*, consisting of a basement, *k*, four pillars, *pp*, an entablature, *y'*, spandrels, *x'*, and conical apex, *w*. The principal parts of the frame, *A*, are three six-armed rings, *R*<sup>1</sup>, *R*<sup>2</sup>, *R*<sup>3</sup>, which are connected vertically together in the manner to be presently explained, and two laying plates, *tt*, at top of all. The undermost ring, *R*<sup>1</sup>, is connected by a series of cranks, *Cee*, with the second ring, *R*<sup>2</sup>, and *R*<sup>2</sup> with the third ring, *R*<sup>3</sup>, by straight vertical rods, *ss*. The centre crank, *C*, is stationary, and stepped by its short arm in a pedestal, *N*, attached to the basement of the outer framework, *A'*, while the undermost ring, *R*<sup>1</sup>, is attached to a loose boss, *r*, slipped over the short arm of the crank, *C*, so that on a rotating movement being given to the ring, *R*<sup>1</sup>, it carries round with it the ring, *R*<sup>2</sup>, by means of the side cranks, *ee*—that is to say, the side cranks, *ee*, which may be called live cranks, are made to revolve round the centre or dead crank, *C*; while the ring, *R*<sup>2</sup>, in its turn imparts, through the medium of the vertical rods, *ss*, a simultaneous rotary movement to the top ring, *R*<sup>3</sup>. The long arms of the connecting cranks, *ee*, carry the reels or bobbins, *gg*, on which the yarn or wire is wound, and as they revolve at fixed and invariable distances round the centre or dead crank, *C*, any twist of the yarn or wire, which is in the course of being laid, is effectually prevented. The requisite rotary motion is given to the machine, by means of a pair of bevel wheels, *B*<sup>1</sup> and *B*<sup>2</sup>, the former of which (*B*<sup>1</sup>) is attached to the loose boss, *r*, on the short arm of the dead crank, *C*, and the latter (*B*<sup>2</sup>) to a shaft, *S*, which is turned by a steam-engine, or other first mover, through the medium of the riggers, *aa*. The long arm of the dead crank, *C*, carries at top a reel or bobbin, *u*, from which the heart or core for the rope or cordage (of whatever material such heart or core may be) is supplied. The yarns or wires from the different bobbins pass through guide holes in the topmost ring, *R*<sup>3</sup>, and meet and unite with the core at the laying plates, *tt*. To the revolving shaft, *S*, and at a little distance from the riggers, *aa*, there is attached a worm-wheel, *h*, the threads of which take into a tangent-wheel, *i*, and thereby give motion to a whelp-wheel, *j*, keyed to the axis, *k*, of *i*. The whelp-wheel, *j*, serves to receive or take away the strand or rope as it is delivered from the twisting or bobbin frame, *A*, over the pulley, *Q*. The whelps, *ll*, of the wheel, *j*, are moveable to and fro in slots, as usual, so that they may expand or con-



tract (as it were) in proportion to the lay of the strand or rope. On the axis, *k*, of the wheels, *i* and *j*, and outside of both, there is keyed a flat grooved rigger, *m*, which is connected by a band, *n*, to a similar flat grooved rigger, *o*, keyed on a separate shaft, *P*, which carries a double whelp-wheel, *g*, by which the strand or rope is carried along as it is completed.

And, secondly, my invention, in so far as it regards the fitting and using rope or cordage, has special relation to the application of wire rope or cordage to the standing rigging of ships, and consists in the improved contrivance for the purpose represented in fig. 3; *a*, represents the side of a vessel; *B*, the chain plate; *D*, a spring lanyard of the ordinary form; *f*, a tube, in which the lanyard is enclosed; *c*, a slip shackle; *e*, a stud attached to the front of the tube, *f*, and having an orifice in it, through which the forelock, *e'*, is passed. By taking out the forelock, *e'*, and pulling down the tube, *f*, the shackle slips up and opens out, whereby the rope can be instantly disengaged as may be required.

Claims.—First, I claim the mode of giving motion to the reels or bobbins in the manufacture of rope or cordage before described, in so far as regards the employment of a central stationary crank, *C*, and of other cranks, *ee*, carrying the reels or bobbins, and made to revolve round the same at fixed and invariable distances.

And, second, I claim the combination of the slip shackle with the elastic screw lanyard, as before described.—*Mechanics' Magazine*.

## ELECTRIC TELEGRAPH MANIPULATION.

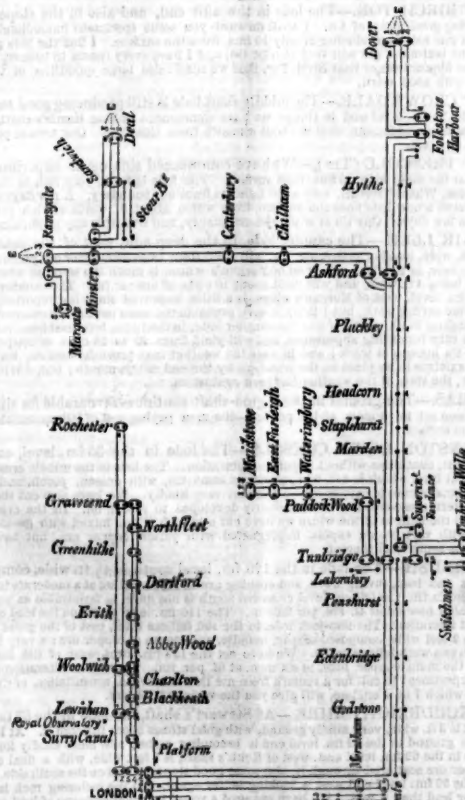
A fifth part of *Manipulation in the Scientific Arts*,\* by Mr. Charles V. Walker, superintendent of the electric telegraph on the South Eastern Railway, has just appeared, the subject chosen being that with which he is so intimately connected—the manipulation of the electric telegraph. From such a source his readers would naturally expect the subject to be treated in a masterly manner, nor will they be disappointed; the whole *rationale* of the generation and movements of this wonderful messenger are clearly described; its actions, under different and ever-varying circumstances, explained, with all the arrangements of voltaic batteries, galvanometers, telegraphic instruments and wires; the telegraphic instrument, the alarm, the electro-magnet, and the entire system of telegraphs, working as a whole. We are also let into some of the secrets of that *arcaneum sacrum*, the electric telegraph office; and the author displays in the most convincing language, and by a simple truthful statement of facts, the immense advantage to governments, the public interests, commercial speculation, private enterprise, and personal comfort and safety, this command of heaven's lightning in the hands of man has become. In fact, it may now be estimated as another addition to the necessities of civilization, and which will, probably, eventually prove the most powerful engine for the establishment of peace and plenty, and the comfort and happiness of the human race throughout all the nations of the earth. It is a little volume, which we so very far consider worthy of more than a passing notice, that we devote some space for extracts, having been favoured by the author with the accompanying diagrams for illustration.

As the action of the voltaic battery, and general arrangement of the telegraph, with the effect of the electric current, with which the first half of the volume is very properly filled, is generally understood, we proceed to the author's description of the entire system of telegraphs, as worked on the South Eastern line, of which fig. 1 is a diagram, placed, as will be immediately seen, not exactly as the lines run, but supposing them in direct angular arrangement, showing the bearing and importance of any particular station with another, which he thus describes:—

The South-Eastern Railway Company possess what may be very well termed a self contained system of telegraphs. They are complete in themselves, and are unassociated, either electrically or commercially, with any other series; they will serve as our illustration. They extend from London to Rochester, and from London to Dover, with branches to the Kent-road, to Tunbridge Wells, to Maidstone, and to Ramsgate, Deal, and Margate, their total length being about 132 miles. Fig. 1 is a plan, showing the arrangement of the telegraph apparatus in this district. The lines represent the wires, numbered in practice, 1, 2, 3, 4, &c., for reference; the half dots are for the alarms, and the dots for the galvanometers; the single dots are single-needle instruments, and the dots enclosed in pairs double-needle instruments. The stations are arranged in groups of not more than six or seven to a group. The lines in the plan are made continuous from end to end of a group; where the lines terminate, or are divided, the group terminates. Our most important group is from London to Dover, on the wires marked 1 and 2; these wires are seen to pass by all inferior stations, and to be provided with instruments only at the important stations of Tonbridge, Ashford, and Folkestone, in addition to the terminal stations. As they pass these stations, they have shackles inserted; and wires are led in to the instruments from each side of the shackle. To make provision for the smaller stations, a second pair of wires, numbered 3 and 4, go from end to end of the line; these wires, however, are cut and made to terminate at Reigate, Tonbridge,

Ashford, and Folkestone, so as to form five shorter groups of 3, 5, 6, 3, and 2 stations respectively. The series between Dover and London consists of five double-needle instruments; and the bell is on one or other of the wires, as shown in the plan. The short

Fig. 1.

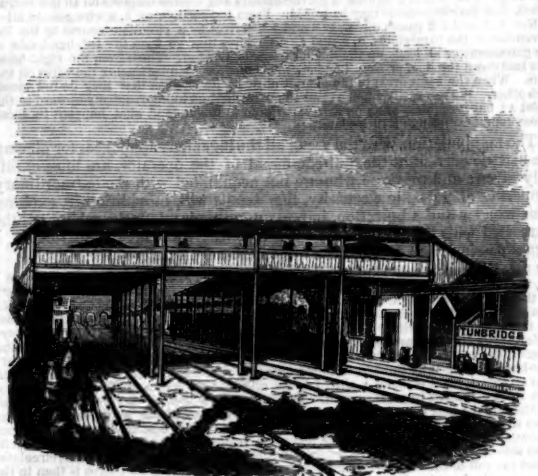


groups consist, some, in like manner, of double-needle instruments, having the bell on one or other of the two wires; and others of single-needle instruments, occupying one of the wires, and alarms occupying the other. London to Reigate, including Merstham, have three double-needle instruments; Dover to Folkestone, two; Reigate to Tonbridge,

including intermediate stations, two; and the like is the case for the six stations between Reigate and London, inclusive; and for the three from Ashford to Folkestone, inclusive. The wires, making six in all, may be seen from Reigate to the tunnel beyond Merstham; and from London a pair goes to Bricklayers' Arms stations, and two pairs to Gravesend and Rochester, making ten in all entering the London station. It is obvious, therefore, that the number of wires that may be seen on a railway does not imply, as hundreds of people imagine, that the telegraphs of England require several wires to work them; but, rather, that there is a very extensive system, and a large number of stations to be supplied. As far as the telegraph itself is concerned, we might have used but two wires between London and Dover, or even but one; and have led these wires into every station. We should thus, however, have crowded the wires with a group of eighteen stations; and as no two pair of stations could use the same part of the wires at the same time, the communications between Dover and London would be perpetually interrupted; and they, on their part, would interrupt others. And then, although all stations would be nominally telegraph stations, they would virtually be quite the reverse; for there would be constant waiting, and confusion, and interruption.

The North Kent line, from London to Rochester, has, in like manner, a through group of five chief stations on one pair of wires; and two shorter groups, of six and seven stations respectively, on a second pair. They are all double-needle instruments, with alarms on one of the needle wires. The branches to Tunbridge Wells, to Maidstone, to Ramsgate, to Deal, and to Margate, have each a pair of wires for double-needle instruments at the stations marked on the plan, and a third wire for the alarm. At Tonbridge, the switchmen have single-needle instruments and alarms on the one and the same wire; at Tunbridge Wells they have instruments on one wire, and alarms on a second. We have thus illustrations of several methods of combining the apparatus. All stations are furnished with an earth-wire. All groups must terminate in the earth; and hence the use of the earth-wire at Margate, Ramsgate, Deal, Dover, Maidstone, Tunbridge Wells, London, Rochester, &c., is obvious. And, when describing the ringing-key, the application of the earth-wire enables us to sound the alarms in either required direction.

Fig. 2.



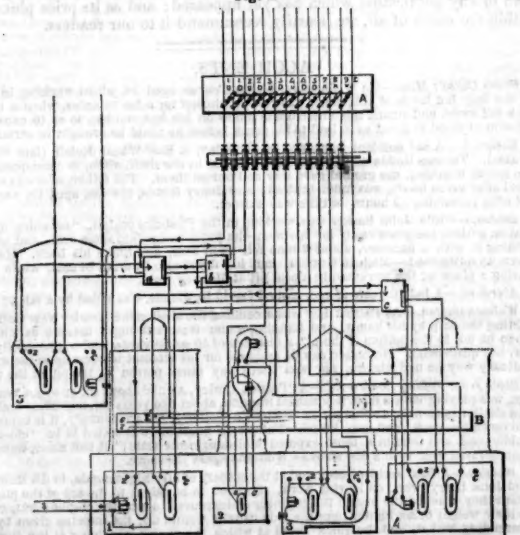
We are now introduced to the Tonbridge station (the principal on the line), of which figs. 2 and 3 are correct external and internal views, and upon which the author gives us the following details:—

Fig. 3.



The Tonbridge office will serve as our illustration. By referring to the plan (fig. 1), the commanding position of this station may be seen; it is midway between the capital and the coast, and in a central position in regard to the rest of the district. Here the conduct and management of the telegraph department is carried on; we have here our staff for maintaining the integrity of the line work, for cleaning and repairing the apparatus, and for keeping all stations supplied with battery power, and here we keep our stores. We befriend and assist all stations, and are their prime resource in times of distress and difficulty, helping on their messages when their own powers are crippled, and

Fig. 4.



under all circumstances, securing the successful working of the line. To make this station as effective as possible, I have furnished it with a very perfect set of apparatus, so that it will serve our present purpose admirably. Fig. 3 is an accurate sketch of the interior of the Tonbridge office, just as it now appears. The telegraph table supports four instruments, and there is a fifth on a bracket on the wall. The wires, which are cotton-covered copper, enter the room above the window, and passing on in the closet beneath the table, and others are in a battery room across the station-yard. The closest to the left is the rubicon beyond which, by the necessary rules of the telegraph service, the public are not allowed to pass.

Fig. 4, which is drawn to scale, is a plan of the wires and instruments, shown in their places in Fig. 3. The wires may be studied in correspondence with the line-wires (fig. 1), from which indeed they are led. They are numbered on their right to correspond. Nos.

\* "Electric Telegraph Manipulation: being the Theory and Plain Instructions in the Art of Transmitting Signals to Distant Places, as practised in England, through the combined agency of Electricity and Magnetism." By CHARLES V. WALKER, superintendent of telegraphs to the South-Eastern Railway Company. London: George Knight and Sons, Foster-lane, Cheapside.







The usual vote of thanks to the chairman and committee having been given, the meeting separated.



## CWM ERFIN MINING COMPANY.

A general meeting of shareholders was held at the offices of Messrs. J. Taylor and Son, Queen-street-place, Upper Thames-street, on Friday, the 5th inst.

WILLIAM NICHOLSON, Esq., in the chair.

The MANAGER (Mr. John Taylor, jun.) represented (as per subjoined report) that the progress of the mine was highly satisfactory, and, to bring the same into a more productive and profitable position, that further capital was necessary. It was resolved, that the committee be authorised to make calls, not exceeding, in the whole, the sum of 25. per share, such calls to be paid by instalments of 10s. per share, at intervals not less than two months, and that the first instalment be made payable on or before the 20th of May next.

The following report was then read to the meeting:—

April 5.—In accordance with the wish of your committee, I have summoned the present general meeting of shareholders in this concern, to lay before you a report upon the present state of the mine, to explain the course of proceeding which must be adopted, and to inform you of the necessity of providing funds to place the mine upon a safe and proper footing. To describe the mine, I may say there are two shafts—the western one, called the engine-shaft, and the eastern one, called the whim-shaft. Both are sunk upon the lode, except for a few fathoms from the surface; they are small, crooked, and inconvenient. The engine-shaft is sunk 18 fms. deep below the adit level, where it reaches what is called the 20 fm. level. The whim-shaft has reached the same depth. The 20 fm. level has been extended a few fathoms to the west of the engine-shaft, but the lode in that direction is poor; eastward it is driven 26 fms. through a run of ore ground which is said to have yielded 1 ton per fm.; a length of road ground, of about 30 fms., was then passed through; and recently another run of good ore ground has been opened for 23 fms. in length at the depth of the same 20 fm. level, from a winze sunk below the 10 fathom level, at the eastern extremity of the mine. The forebrest of the 20 fathom level, now driving east, is in a large promising lode, yielding from 1 to 5 cwt. to a ton of rich ore per fm., and there is reason to hope that a reasonable extent of ground may be found in advance of the present workings. The western run of ore ground is nearly worked out from the 20 fm. level upwards; the eastern one, however, remains in reserve, and may soon be sloped away to advantage. The surface arrangements are very badly contrived; there are no facilities for working the mine economically, and the machinery ill-placed and ill-constructed. The situation of the mine is good, and a moderate outlay will remedy these wants and defects. The course of proceeding which I should recommend for adoption is, that the western or engine-shaft should be well repaired, and, as rapidly as possible, to the depth of a 20 fm. level, and that that level should be driven eastward with all possible dispatch. This level would probably place at command ore ground which would yield 50000, or 90000, worth of ore, limiting the computation to the length already proved in the mine.

The 20 fm. level must, of course, be pushed forward with all speed; and it is probable that the 10 fm. level also must be driven on into the high ground in advance of it. The drainage of the mine will be best effected in the engine-shaft. For the present, the small water-wheel may be adapted to the purpose; but, eventually, a wheel of much larger diameter can be applied. For the hauling of the stuff, the whim-shaft must be well repaired and properly fitted, and a drawing machine must be applied to the larger water-wheel now in use for pumping. In addition to the drawing, this wheel can work a crushing-mill of much more ample power than the one now in use. At present, the drawing is done by horse-whims—an operation which is slow and costly anywhere, but especially so in Cardiganshire. Upon examining the neighbouring valleys, I found there is a stream of water to be had which, at a moderate cost, can be brought over all the dressing-floors and machinery at Cwm Erfin; and a treaty has been concluded with the owners of the land for the permission to make the water-courses. In a few days, I hope to be able to order this work to be completed. The dressing-floors require to be entirely remodelled. The series of which I have spoken, and the alterations which will be apparent at once. I have now enumerated the works, which are, in my opinion, indispensable to an advantageous working of this mine. To enable me, however, to carry them into effect, it is necessary that the shareholders should decide upon some plan for raising funds. I estimate that about eight months in time, and 20000, in money, will be required to place the mine in a good state of working; and I do not hesitate to say that it well deserves such an outlay upon it. I have applied to Mr. Jones, the lord of the mine, for an abatement of his royalty, to enable me to carry out the works, and he has been very glad to say that he has been willing to make this reduction. I have also applied, on behalf of the Cwm Erfin Mine shareholders, for a grant of Mr. Pryse Loredon's land, which adjoins Mr. Jones's land on the east, and there is every reason to believe that a lease of this land will be obtained. In conclusion, I would state that you possess a mine of considerable promise; and that I should recommend you, in the present state of the lead market, to bring it into a productive state as rapidly as possible. If it be once placed on a safe and profitable footing, I should not fear that it could be so maintained for a number of years.

## DRAKE WALLS MINING COMPANY.

The annual general meeting of shareholders was held yesterday, at the offices, Salvador-house, Bishopsgate-street.

P. STAINBY, Esq., in the chair.

After the usual preliminaries, the CHAIRMAN read the report of the committee of management:—

In presenting to the shareholders at this annual meeting the usual yearly accounts of the Drake Walls Mines, the committee consider they may fairly congratulate their fellow-shareholders on a very general improvement throughout the mine; for, although they have not yet arrived at that desirable point of a dividend-paying mine, they have made a considerable advance during the last year towards this point. A section of the underground workings, with a reference thereto for explanation, will be laid before you, by which it will be seen that a large amount of ore ground is being laid open, which will, in the course of a short time, enable the agent to put on a very considerable number of hands on productive work, when the mine is thoroughly and effectually laid open. This has been in a great measure the leading point of the exertions of your committee during the past year. The section will show that a large extent of ore ground will very shortly be added to that already made available. These large works have necessarily been expensive. You may reasonably expect corresponding advantages by increased returns during the current year. The ground spent in shafts and rises, during the past year, is 78 fms. 3 ft. 7 in., at a cost of 8234. 12s. 8d.; in driving levels, 204 fms. 0 ft. 1 in., at a cost of 10951. 14s.; ground stoped, 1319 fms. 3 ft. 11 in., at a cost of 34575. 5s. 2d. The setting report shows 275 persons were engaged in the various operations at the mines. The report of Capt. Webb, the managing agent, is written with great care and attention, and will give you full particulars on the present prospects and appearance of the mine. The committee feel, however, that it is necessary they should explain to you that, previous to the last year, owing to the then very unsatisfactory state of the tin ore market, irregularities did, in fact, creep into and derange the proper placing of the returns against the respective months' costs, so as to allow the ores to override the other.

This irregularity has now been put straight, but at the immediate cost of the past 12 months. This year's accounts show that 11 months' returns (through 12 sales) and 12 months' costs, which, taken on the average of returns, would be about 8000. There are other charges not applicable to that particular year, which have been paid, and, if taken on the whole, will amount to about 12000. We now, however, start clear with the current year, and have every expectation that it will terminate advantageously. During the past year the mine has sold a quantity of tin ore, which has realised 59457. 15s. 5d. The excess of expenditure over the returns has in part already been accounted for to the extent of 12000. It remains to be explained in the month of March, last year (in consequence of the previous rise in the value of tin ore), to put the eastern part of the mines in an efficient state of working, this was done at a cost of little short of 16000. All this, it should be borne in mind, is extra work, and which is but now beginning to be available as productive ore ground. At the eastern boundary of Drake Walls Mine lies Wheel Russell Mine, the discoveries of copper ore in which are attracting considerable attention in the neighbourhood. The locality of this mine, and the contiguity of its workings to our boundary, and the fact of their lodes running directly into Drake Walls Mine, cannot fail to be interesting to every shareholder; and the fact that the lodes, as being 2 ft. 6 in. and have produced several parcels of good copper ore during the past year. The workings in Wheel Russell, on this lode, are (say) from 30 to 40 fms. from our boundary. Your committee wish to draw your attention to these lodes, and to the interest the discovery of them has created, and must necessarily keep alive in the minds of all the shareholders in this undertaking. The course recommended by Mr. Johnson in respect to them will, in part, be explained in Capt. Webb's letter. Your committee wish to add, in conclusion, that the mine is in much better working order now than ever it was. There is now a large stock of ore ground discovered, and, which has cost, during the year, 9044. 17s. 3d. to lay open, and which is now available.

A detailed report from Captain Webb was also read; but for want of space it must be deferred until our next Number. It gave satisfactory testimony as to the promising position of the workings, and of its shortly becoming a dividend-paying mine. The following balance-sheet was submitted:—

Dr.—Balance last account ..	£234 12 11	Ca.—By ores sold .....	£2915 15 5
Cost, 12 months, to Dec. 31, 1845 ..	11,245 5 3	Eighteen call .....	1280 0 0
Interest .....	57 12 3	Balance against shareholders 1845 ..	1413 9 7
Sundries .....	11 9 2		
	£11,330 5 0		£11,639 5 0

The report and accounts were unanimously adopted, and ordered to be entered in the minute and transfer books; a resolution was passed, as a recommendation to the committee, to make a call of 10s. per share, to pay off the above balance against the mine, incurred by the erection of costly machinery, and laying open the mine; and, thanks having been voted to the chairman and Mr. P. N. Johnson, the manager, the meeting separated.

## WHEEL SETON MINING COMPANY.

At a meeting of shareholders held at the mine on the 8th inst., the accounts were examined and passed, showing—Copper ores sold (less dues, 2531. 1s. 10d.), 35434. 6s. 7d.; ditto western ground, 2861. 8s.—38299. 14s. 7d.—By labour cost, Jan., 11601. 3s. 2d.; ditto Feb., 12141. 1s. 5d.; merchants' bills, 5291. 16s. 11d.; leaving profit on the two months, 9251. 13s. 1d., to which add balance last account, 5022. 19s. 5d.—14282. 12s. 6d.; from which deduct dividend, 51. per share, 9907. leaves balance to next account, 4384. 12s. 6d. The next meeting was fixed for the 10th June next, and the following report, from Capt. Paul Raby, Stephen Lean, and J. T. Phillips, was read:—

April 8.—At the 119 cross-cut north we have cut a large stream of water, which has drained the 100 fm. level, and are expecting daily to intersect Kneebone's branch and the north counter lode, which must be nearly together in this level. The north counter, in the 100 fm. level west, has, since our last report, yielded on an average about 4 tons of ore per fm.; but, within the last two days, we have discovered another portion of the lode, slanting to the north of the level; we have cut into it 3 ft. through a fine course of ore, and have not yet reached the north wall. In the 90 fm. level west the lode is 4 ft. wide, and will produce 3 tons of ore per fm. The lode in the winze sinking below this level is 6 ft. wide, and will produce 5 tons of ore per fm. We expect to communicate this to the 100 fm. level by the end of this month, when we shall lay open a good piece of ore ground. In driving east on the south part of the lode, in this level, we haled to Kneebone's branch; it continued productive to the point of intersection. The back of this level is set on tribute, at 5s. in 12. In the 80 fm. level west the lode is much improved, now yielding 6 tons of ore per fm. In the 70 fm. level, west of Tilly's shaft, the lode is 5 ft. wide, and is also much improved, producing 3 tons of ore per fm., with every prospect of a further improvement. The lode in Tilly's shaft, sinking below the 70 fm. level, is 4 ft. wide; it will produce 3 tons of ore per fm., and looks very kindly. We shall complete the shaft to the 60 fm. level by the end of the present month, when we shall commence driving east and west on the course of the lode, with every prospect of laying open good ore ground. The 60 cross-cut, north of this shaft, has been extended from 40 to 50 fms.; the ground is more favourable for driving. The ground in the 50 cross-cut south is harder for driving. At the

south counter, in the 90 fm. level west, the lode is 4 ft. wide, composed principally of spar, with streaks of ore. In the 80 fm. level west the lode is 3 ft. wide, composed of mundle and spar; this level is suspended for the present, and the men are put to sink a winze in the bottom of the level, where the lode will yield 3 tons of ore per fm.; this winze is about 15 fms. before the end of the 90. The lode in the winze sinking below the 70 fm. level is 4 ft. wide, and of a very kindly appearance. At Kneebone's branch, in the 100 fm. level west, the lode will produce 3 tons of ore per fm.; we have no north wall. In the 90 fm. level west the lode will produce 3 tons of ore per fm. In the 44 fm. level east, on the new lode, the lode is 1 ft. wide, composed of spar, with occasional streaks of ore. In driving the 64 cross-cut, south from Cock's engine-shaft, we have intersected the last-mentioned lode, which is 18 in. wide, composed of spar and mundle. The ground in the north cross-cut, in the same level, is harder for driving. The ground in the 34 cross-cut north is also harder for driving. Our tribute pitches continue to turn out well, and we shall have no difficulty in maintaining our present returns; and, from the continued improvements in our levels, and more particularly that in the 100, on the north counter, and in the western part of the set, we may confidently rely on the increased prosperity of the mine.

## LOW'S PATENT COPPER COMPANY.

At the annual general meeting of shareholders, held at the offices of the company, on the 8th inst.—CHARLES HUNT, Esq. (chairman), in the chair—the following report of the directors was read:—

The directors, at the last annual meeting, reported that the necessary preliminaries for the establishment of the company, and other general purposes, had been, with a trifling exception, completed; they have now nothing further to report on that subject—no occurrence of importance, or calling for particular remark, having arisen during the past year in the general management of the company. [The statement of the accounts up to the 31st of December last, with the auditor's report thereon, were then read.] From these it will be seen that, after payment of the stipulated price of the patent right to Messrs. Low and Routledge, the whole amount of legal and other expenses incurred in the establishment of the company, and dividend at the rate of about 8 per cent. per annum on the paid-up capital, there remains on hand an unappropriated balance of profit amounting to nearly 30000. These results will, it is hoped, be deemed at least satisfactory, especially when it is considered that, on several occasions during the year, the works were partially or wholly stopped, in consequence of insufficient supplies of ore. On this important point—an adequate supply of ores—your directors regret that the expectations they expressed at the last yearly meeting have not been realised. This may have arisen in some degree from the high prices paid for ores at the public sales, which have been, on the average, much above those given for many previous years, and have indisposed mining adventurers from resorting to other modes of sale; but your directors believe that this state of the market is only temporary, and they are still of opinion that the principle of purchase which this company proposed to adopt will prove, on the average, of even a very few years, more advantageous to mining generally, as well as yielding more regular profit to the smaller, than the system which has for many years prevailed. They are, therefore, adverse to any deviation from that principle—at least so long as there exists any fair hope of its becoming more extensively adopted; meanwhile, they may state that the supplies they have engaged, though still insufficient, are considerably larger than hitherto, and there is reason to expect a further increase, while less difficulty will be experienced in supplying the deficiency from other sources.

The report having been adopted, the retiring directors and auditors were re-elected.

## UNION TIN SMELTING COMPANY.

The ordinary half-yearly meeting of shareholders was held at the offices of the company, Salvador-house, Bishopsgate, on Wednesday, the 10th inst.

RICHARD HODGSON, Esq., in the chair.

The advertisement convening the meeting having been read by the secretary, the report and accounts were also read, which were deemed highly satisfactory; a discussion arose as to the dividend to be declared—it being proposed on the part of the committee that such should be confined to 10 per cent. per annum on the capital advanced, which it was admitted would leave a surplus to be carried to account, and which might be divided at the next half-yearly meeting, when the accounts were made up. In the end, this course was adopted, and the surplus carried forward.

From the observations made by the Chairman and Mr. Stainsby in the course of the proceedings, we collected that the accounts submitted to the meeting were made up to the close of the past year, and that the capital employed up to that period was only one fourth part of that now engaged; that, moreover, the business of the company had advanced considerably, and that while the directors had to congratulate the proprietors on the result, it was equally satisfactory and pleasing to state that the benefits and advantages arising from the establishment of the company were reciprocated and advantaged by the tin mines, with which the shareholders of the company were associated.

## GRAMBLER AND ST. AUBYN MINING COMPANY.

At a meeting of shareholders held at the mine, on the 9th inst., the accounts were examined and passed, showing balance in favour of shareholders of 581, after charging all the back debt and law cost. It was resolved to get the water in for the 25 fm. level, drive a cross-cut north about 16 fms., and cut Vice's lode, where they expect to have a course of ore; put a flat-road from the engine-shaft to Simmons's shaft, and prove the lode there, and continue the adit east towards it. It is thought 10000 will be sufficient for the whole of this work, and that it can be completed in nine months. The tin in the adit end, on Simmons's lode, will still about pay for driving, and will make pitches when there is air to work them, which cannot be until a communication is made with Simmons's shaft. There is now a branch of black and grey ore in the lode, about 4 inches wide, and it requires 38 fathoms to drive to reach the shaft. A call of 25. per share was made.

## KINGSETT AND BEDFORD MINING COMPANY.

At a special meeting of shareholders, held at the Half Moon Hotel, Exeter, on Monday, the 8th inst.—Lieut. COL. HARDING in the chair—an explanation was offered as to the causes of the 20. 10s. per share, which it was stated would be sufficient to develop the resources of the mine, having been expended without success. It appears that an important discovery of rich lead ore took place 12 months since, but it was not considered prudent to incur the expense of erecting machinery until the mine was further developed, and the wheel should be erected, to set tribute pitches, and prepare ore for the market. A water-wheel, grinder, stamps, and drawing machine, have been purchased, and are now in course of erection, the cost of which, in addition to the monthly cost, has fallen very heavy; but once paid for, and at work, no similar expense will again occur. The following amounts have been paid during the past two months, in addition to the monthly cost:—

Paid for water machinery .....	£278 0 0
Iron work for tramway .....	56 12 0
Grout of water .....	90 7 6—£355

The following is the probable estimate for liabilities, until the wheel, crusher, stamps, and drawing machine, are erected:—

Due to lease for working cost of mine .....	£430 0 0
Erection of machinery .....	130 0 0
Estimated cost for March, April, May, and June .....	400 0 0—£960

The meeting adjourned to the 15th inst., when a call of 17. per share will be proposed, payable by two instalments, on the 29th inst., and 29th May, which will leave balance in hand of 641.

## WEST POLGOOTH MINING COMPANY.

The two-monthly meeting of shareholders was held at the office, on the 11th inst.

RICHARD HALLETT, Esq., in the chair.

The minutes of the last meeting were read and confirmed.—The accounts of the past month, amounting to 1211. 15s., were examined, passed, and ordered to be immediately paid.—The following report, from the agent, was read:—

Our engine-shaft is now down to the adit level, the poppet heads completed, and the whim ready for work. We have explored several fathoms of the old lode and stoped the lode in which all has been taken away; the ground presents the appearance of a honeycomb, showing what an abundance of tin the ancients must have had. Above the water level we occasionally meet with arches that were left, which our tributers remove; it is very good work indeed. There is a great quantity of tin that will pay for returning when our new steam-stamps are set to work. When we get down to the 16 fm. level we shall find an abundance of tin, which will immediately put the mine in a paying state. The present appearance of the mine is very cheering, as it must be evident to all that a great deposit of ore ground is within a few fathoms of our present depth; if it was not so, the lodes above water level would not have been so extensively worked away. Our tributers have returned a small sample of tin this month from the pile raised, and now being stamped out; it realised 381. per ton, which, for attle, must be considered very excellent work. The ground has been excavated for the engine and boiler-house, and the masons have commenced laying the foundations. We have an abundance of stone, which we are getting from a quarry on the mine. We are clearing an old whim-shaft, about 60 fms. west of the lode, which will enable us to lay out a large quantity of tribute ground when we are down to the 16 fm. level.

The tin bill produced was considered satisfactory, as showing the value of the produce of the lodes.

## ASTURIAN MINING COMPANY.

We have received an abstract of the proposed alterations from the original project of reconstitution of this company, of which the following are the material points:—

1. The deed is to be strictly a Spanish deed, prepared in Spanish, and executed in Spain by the English shareholders, under power of attorney.
2. The preference stock is to be superadded for two classes of security by way of mortgage.—First, a mortgage of 20,0000, payable in two years, to form part of the assets of the Asturian Company, and as such to be distributable, *pro rata*, amongst its shareholders, which mortgage is to form the consideration for the purchase of the works and mines; and, secondly, a mortgage for the residue of the permanent stock (50,0000), to be apportioned in debentures to the shareholders of the new company, and paid from a fund, to be raised out of the profits. These securities to be made charges upon the company's property.
3. A sum, not exceeding 50,0000, is to be raised for working capital, of which only 500000 is required for present outlay, and it is stated that 20,0000 will suffice for 12 months floating capital.
4. The permanent stock is to be represented by paid-up shares, completing, with the amount of debentures, the amount of 100. for each Asturian share, on which 172 shall have been paid.
5. The holders of the commuted 100. shares are to transfer their interest in the Asturian Company to the representatives of the new company.

In other respects the project remains as before.

## WINDING UP OF THE ANGLO-MEXICAN MINING COMPANY.

TO THE EDITOR OF THE MINING JOURNAL.

SIR,—Certain letters of mine appeared last year in the *Times* and the *Mining Journal*, respecting some of the old Spanish American mining companies; but I chiefly referred to the Anglo-Mexican, because I had a better knowledge of its affairs, and of those directional shortcomings which have resulted in so much of loss to the long-suffering shareholders. I shall not here recapitulate the grounds on which the Anglo-Mexican board have forfeited all title to the confidence of the *bona fide* shareholders; those grounds are fully set forth in my two letters that appeared in the *Mining Journal* of the 11th and of the 25th of August, 1849, and are, in no degree, impugned by the *ad-distant* corrections of the secretary, which was so obligingly inserted at my request in your *Journal* of the last-mentioned date. My present object, Sir, in addressing you, is to impress upon the Anglo shareholders, through the columns of the *Mining Journal*, the propriety of looking sharply after their few remaining assets; because I mean to convince them that the dividend of 10s. per share paid last Oct. ought to have been a 20s. one at least, if the balance-sheet be correct that was laid by the directors before the last annual meeting, held at the office of the company, on Wednesday, the 4th of July, 1849. The following is the official statement of the company's finances in England at that period:—

Assets.—Loan to the Mexican and South American Co. ..	£6500 0 0
Interest thereon at 5 per cent. ..	
Exchequer Bills, including interest ..	3473 0 0
Cash at the bankers ..	771 13 5
Ditto in hand ..	84 0 0=£11,167 14 2

Here, then, is an admitted sum in England at the above date of 11,167. 14s., besides the interest due from the Mexican and South American Company, of which no particulars are given; and, in addition to this sum, the *realised assets* in Mexico were stated on the report to amount to £21,544 at the date of the last letters received from the company's commissioner, Mr. Brough; and the report then goes on to say, "that Mr. Brough was making arrangements for remitting this balance in bills on England; that he expected, by the following packet, that this arrangement would be carried out; or, if the exchange should be unfavourable, specie for the amount would be sent forward by the June conducta"—*id est*, by the conducta that would leave Guanaxuato in June, 1849.

It may fairly, then, be assumed that this remittance reached the hands of the directors before the dividend declared on the 16th of last Oct.; and putting down the amount of cash it realised at the moderate figure of 40000 sterling, we shall find a sum in England in Oct., 1849, of 15,167. 14s.—against which there could be no claims, but for a few office expenses; yet the directors only declare a dividend of 10s. per share, which, on 12,500 shares, amounts to 625000; and they give no explanations to account for the smallness of this first instalment.

It seems most probable, then, that the loan to the Mexican and South American Company of 65000 has not been called in; and, if this be so, I tell the Anglo directors that the sooner they realise it, and pay another dividend, the better; and I further tell them, on behalf of one of the largest proprietors of shares, that he at least would rather have his quota of the sum in question lodged with his bankers, than loaned, even at 5 per cent., to the flourishing concern referred to.

In fact, the directors must bestir themselves, or they may, perhaps, find the company winding up under a certain Act of Parliament. The patience and forbearance of the Anglo shareholders has been already sufficiently tested at a high pressure by this precious board, which, since the year 1825, has unnecessarily expended nearly 1,200,000, has never paid a farthing of dividend, and is now winding up the affairs of the association, with the prospect of a return of 30s. per share, so that each original adventurer loses 98. 10s. out of every 1000. invested, besides a 20 years' loss of interest into the bargain.

Charles-street, St. James's, April 11. C. RICHARDSON.

\* From this, however, must be deducted 1400, on account of the 230 forfeited shares, on which there are arrears of call to the amount of 11,1500.

## ASTURIAN MINING COMPANY.

SIR,—I have to trespass on your valuable space, merely to guard the actual shareholders of this company from the propagation of an error which I learn some persons, pretending to a knowledge of law, are endeavouring to disseminate—viz., that the statutes of the company are not binding on the shareholders. It is as well that it should be generally understood that the board of directors and liquidators are prepared to abide by those statutes for the administration of the affairs of the company, so far as they are applicable to the liquidation.—R. MOORE: London, April 12.

## BWLCH CONSOLS MINE.

SIR,—I cannot permit Capt. M. Francis's report on the Bwlch Mine, published in your *Journal* of 23d ult., and Mr. Evan Hopkins's letter, in your last Number, on the subject of stopping the ground in this mine, to pass unnoticed. The former gentleman says—"It is necessary here to observe, that, in pursuance of Captains Prince and Middleton's report, we have made several experiments, which have convinced us that it is unsafe to work this ground underhand, leaving several fathoms of the walls of the lode open above, as rocks have in numerous instances slipped down, and we have had several men injured thereby."—Mr. Evan Hopkins, who went underground to convince himself as to the produce of the vein, and the best method of practically mining it, says that the only way to work the mine for safety, and to obtain all the materials worth working, is by a series of subterranean quarries, such as we have hitherto pursued." These assertions have not only been corroborated by Mr. Hopkins in his letter in question, but that gentleman having commented on the impracticability of stopping the ground underhand, it is made to appear that Captain Middleton and myself recommended a system of working to the directors which their agent, having subsequently tried, has not found to answer, at least, his purpose. In reply to which charges, I beg to say, that we do not consider stopping underhand to be an ordinary system of mining, nor do we adopt this method when the excavations can be conveniently carried on from the galleries upwards—because, in the former case, all of the stuff broken must be brought to surface, whereas, in the latter case, the non-metallic parts of the lode, and the adjacent rocks, might be left underground, and thus obviate the necessity of using near so much timber as would otherwise be required. The ore, however, in the Bwlch Mine is so dispersed in the rock, that the greater part of the stuff broken is being brought to the surface; consequently, I suggested to Capt. Francis, amongst other matters, the feasibility of stopping underhand (provided the walls would stand), leaving an arch of ground at every 10 or 15 fathoms, to protect the men whilst working—a method I had adopted in several instances with eminent success. The same system of working had also been carried out on a very extensive scale in Drake Walls Mine, near Gunnis Lake, Cornwall; but Capt. Middleton and myself did not recommend any thing of the kind in our joint report to the directors. What we did recommend, both to Captain Francis and to the directors, was this—to sink the shafts for the future a sufficient depth to extend levels, at least 10 fms. apart, instead of driving intermediate, or 5 fm. levels; stopping the "roof," and leaving arches of unproductive ground to secure the side; and with all due respect to Mr. Hopkins and Capt. Francis's judgment, we still believe that this is by far the best system of working the mine, either for the present or future proprietors; and we are prepared to prove this by facts and figures, if required to do so.

Wheal Adams, April 3. JOHN PRINCE.

CONTRACT FOR COALS.—The Commissioners of the Admiralty will receive tenders, on the 30th inst., for the delivery, at Valparaiso and Callao, or at any intermediate port, of 1000 tons of Welsh coals, fit for the service of Her Majesty's steam-vessels. The contract for 1000 tons of coals, for the service of Her Majesty's mail steam-packets at Holyhead, announced for the 12th inst., has been postponed; due notice will be given. The contract for 8000 tons of Walls-End coals, to be delivered at Aden, in the Southern part of Arabia, for the service of the steam-packets of the East India Company, was concluded on the 10th inst., after strong competition.

THE UNIVERSAL INDUSTRIAL EXHIBITION FOR 1851.—We have received a list of the plans, received by the committee, for the building proposed to be erected in Hyde Park. The number of designs amounts to 239. Of these, 34 have been contributed by foreigners; 128 by residents in London and its environs; 50 by residents in provincial towns in England; six by residents in Scotland; three by residents in Ireland, and seven are anonymous.

WORKING RAILWAYS BY CONTRACT.—We understand that an offer has been made to the Great Northern Railway Company, by a well-known railway locomotive manufacturer (not a thousand miles from Leeds), to work the line by contract; and it is further stated to us, that the sureties of the contract were an eminent contractor (an M.P.), and the chairman of one of the metropolitan railways. The offer was rejected, as we understand, on the ground that the company could work the line at least 20 per cent. cheaper than any contractor. Mr. Sturrock, the locomotive superintendent of the Swindon works, on the Great Western Railway, has been appointed locomotive superintendent on the Great Northern Railway.—*Railway Record*.

WOLVERTON LOCOMOTIVE DEPARTMENT.—The steam-hammer used at Wolverton is occasioning a loss of about 12000. per annum to the London and North-Western Company. The original cost of the hammer, and shed for the use of it, is stated to have been upwards of 20000. I learn that the expenses for materials and labour, from the 1st of December, 1849, to the 28th February of the present year—that is three months—were upwards of 4000; while the amount credited on account of the steam-hammer, for the period, was under 1100.—*BALLAST ENGINE CLEANER: Ibid.*

## NOTICES TO CORRESPONDENTS.—(Continued.)

The letter of Mr. Joseph Freeman, the agent to the Low Moor Iron Company, on the Application of Iron for Railway Purposes, shall appear in our next *Journal*.



## Current Prices of Stocks, Shares, &amp; Metals.

## STOCK EXCHANGE, Saturday morning Eleven o'clock.

Bank Stock, 6 per Cent., 2054 7	Belgian, 4 per Cent., 89 1/2
3 per Cent. Reduced Ann., 954 1/2	Dutch, 2 1/2 per Cent., 86 1/2
Super Cent. Consols Ann., 964 1/2	Brazilian, 5 per Cent., 87
3 1/2 per Cent. Ann., 97 1/2	Chilian, 3 per Cent., 58 1/2
Long Annuities, 8 1/2	Mexican 5 per Cent., ex Coup., 29 1/2
India Stock, 10 1/2 per Cent., 267 1/2	Russian, 5 per Cent., 18 1/2
3 per Cent. Consol, for 11th Apr. 95 1/2	Spanish, 5 per Cent., 18 1/2
London, 1000l., 100l. 68s 7d pm.	Porto 3 per Cent., 37

**Mines.**—The amount of business transacted this week has not been above the average; but we find inquiries for shares in most of our leading mines, and for some that have been dormant for a considerable time. We learn that the mines generally, in the counties of Cornwall and Devon, are in a more animated position than they have been for some years, and that the progressing improvements are of a very exciting and gratifying character.

The mines in the Caradon district are looking remarkably healthy. At South Caradon, we learn that a very rich lode has been recently cut. The Phoenix Mines are now likely to remunerate the enterprising company; for, after several years of perseverance and great outlay, they have succeeded in cutting a splendid lode, estimated worth 50l. per fathom, and making a profit of upwards of 500l. per month. Holmbush is reported to have much improved during the past fortnight.

At Wheel Seton meeting, a dividend of 6l. per share was declared, carrying to credit of the mine 48l. 12s. 6d. A profit of 925l. 13s. 1d. was realised on the two months' working. The general prospects of the mine continue highly favourable, and, from the recent improvements, the agents consider there will be no difficulty in maintaining present returns.

At the half-yearly meeting of the Union Tin Smelting Company, a dividend of 10 per cent. on the capital was declared on the 9th inst.

The annual general meeting of the Tincroft Mining Company was held on the 10th inst., when the statement of accounts produced showed a balance in favour of the mine of 918l. 9s. 1d. The sales of ore during the year realised 23,070l. 12s. 11d. The directors and agents report a most satisfactory account of the position of the mine; the present reserve of ore now laid open is estimated at 93,560l.; and a detailed estimate of the value of the ore developed in the respective levels is given in another column, to which we refer our readers.

At the South Tamar meeting the balance-sheet showed credit of 313l. 19s. 9d. in favour of the mines; and, after providing for March and April costs, the assets in reserve will be 2241l. 3s. 1d. The mine is in an improving and profitable position.

At the East Tamar meeting the accounts showed a balance against the mine of 449l. 12s. 1d. A call of 3s. 6d. per share was made; and, from present appearances, there is very little probability of any further calls being required.

At the West Polgoth meeting, according to the report furnished, the surface operations are going on satisfactorily.

At a general meeting of shareholders in Cwm Erfin, the report furnished by the manager, Mr. John Taylor, jun., was considered highly encouraging; and, to bring the mine into a more profitable and productive state by the erection of the necessary appliances, it was deemed advisable to make a call of 2l. per share, to be paid by instalments of 10s. per share, as required, at intervals of not less than two months.

The several other mines in Cardigan under the same able management, are represented to be in a very gratifying and productive position—amongst which we may notice Lisburne, which will sample, on the 22d inst., 120 tons of silver-lead ore; Goginan, 90 tons; and Cwmystwith, 80 tons—being the produce of one month's raisings for each mine. Nanteos is also stated to be highly promising. Bwlch Consols, Court Grange, and Daren Mines, are represented in a most profitable position, as far as the operations are being carried out. Other mines in the same district, under the supervision of Capt. Matthew Francis, are progressing highly satisfactorily—being as yet in a less advanced state.

At the two-monthly meeting of Dyffrynwg Mining Company, it was considered, from the general appearance of the mine, no further call would be required. The agent reports the mine to be favourably progressing; and that 20 tons of lead would be ready for sale by the end of the present month.

At the Rhoswiddol and Bacheiddon bi-monthly meeting, the statement of accounts showed a balance against the mine of 278l. 8s. 4d.—the former balance being 941l. 3s. 11d., which has been reduced by sale of ore and last call. The returns, apparently, are about 20 tons per month. The agent's report furnishes no improvement worthy of notice.

The annual meeting of the Bishopsland Silver-Lead Mining Association was held on the 9th inst., when a call of 5s. per share was made. The mine has been cleared up to the 10 ft. level, from whence several other levels have been extended; and the strongest evidence exists that these mines were formerly worked by the Romans; and their manner of working is here most singularly shown; some of the levels have been so carefully excavated, as to give the appearance of having been done by the chisel. The steam-engine is expected to go to work in about a month.

At the Drake Walls meeting, a very encouraging report was read, from which it appeared that the mine had really made a considerable profit on the year's workings, but the erection of costly machinery and laying open ore ground, had caused a balance against the mine of 1413l. 9s. 7d. There was, however, a large quantity of ore in sight, and more being weekly developed, and profitable returns are expected at no distant date.

At the annual meeting of Low's Patent Copper Company, the report of the directors was read, which, upon the whole, may be deemed satisfactory.

At a special meeting of the Kingstet and Bedford Mining Company, a proposition for making a call of 1l. per share, by two instalments, was adjourned to the 12th (yesterday), which amount is deemed sufficient to liquidate all liabilities up to the end of June next. The prospects of the mine are most encouraging, and the machinery requisite for preparing ore for the market is in course of erection.

At Wheel Mary meeting of adventurers, the balance found against the mine appears 317l. 1s., and a call of 5s. per share was made. The prospects are considered of a more cheerful character.

At the Grambler and St. Aubyn meeting, a balance of 58l. was found in favour of the mine; but to carry out some extensive operations, and bring the mine into a productive position, a call of 2l. per share was deemed necessary.

We learn that a private party have taken up the Callera Mines, in the county of Cork. The mine has been inspected by a highly-respectable and competent mining agent, who reports most satisfactorily of it; indeed, from the stones of ore which we have seen, we should consider it of more than usual promise.

Thirty tons of lead ore were sold at Aberystwith, by the Llwynmales Mining Company, on the 8th inst., at 13l. 13s. 6d. per ton, and we learn that the reports from the mine continue most favourable, the water being now out; there is also a large quantity of ore at grass and on the floors, ready for dressing.

Shares in the following mines have changed hands this week:—Devon Great Consols, East Wheel Rose, South Tolgus, Stray Park, Lisburne, North Pool, Treviskey and Barrier, Tolaillack, Daren, South Basset, Tincroft, Trehanne, Devon and Courtenay, Trelawny, East and South Tamar, Bedford United, Penzance Consols, Kingstet and Bedford, Heignton Down Consols, Bishopston, Mary Ann, Cook's Kitchen, Tremayne, West Caradon, Alfred Consols, Trethvey, Cwm Erfin, East Buller, Pencairg Ddu, and Caenant.

In Foreign Mines, the transactions this week have been in United Mexican, Copiapo, St. John del Rey, Imperial and National Brazilian, Cobre, Santiago.

Letters have been received by the St. John del Rey Mining Association, furnishing the returns for December, producing a profit of 3324l. 17s. 5d. for the month's workings. The supply of stone continues abundant, notwithstanding obstacles to a larger supply having intervened.

The usual weekly report from the Linares Mines represent the favourable prospects unabated. The estimate of ore raised, dressed and undressed, is given at from 90 to 100 tons, and advice of shipment to Seville for England may be shortly expected.

The Copiapo report for December has been received, and furnishes a very gratifying account from the mines. The produce from the copper mines has been considerably increased, the produce for the month being 72 tons. The San Pedro Copper Mine is much improved, and continues highly productive. The silver mines generally continue without any material alteration, the returns being as remunerative as any previous advices. The produce at Al Fin Hallada for November and December is estimated at 66 tons, worth 100l. per ton. The gold mines are represented as highly encouraging, but the want of men is severely felt. The Zion, with 468 tons of copper ore, arrived at Swansea on the 5th inst.

**HULL, APRIL 11.**—The market remains in a very inactive state, and the business done is generally at the lowest quotations.

**COPPER TRADE.**—At the monthly meeting of the smelting firms, held on Wednesday, the 10th inst., it was decided that no change should take place in the price of copper during the present month; the standard, however, we have too much reason to fear, will be reduced.

**EXPORTS OF METALS IN MARCH.**—The Board of Trade returns of exports for the month of March show an increase on the total, as compared with the corresponding month of last year, of 556,746l. and 908,645l. over that of 1848. The following are the mineral and metallic exports for March in each year:—

	1849.	1850.
Coals and culm .....	91,385	79,345
Earthenware .....	64,988	74,649
Glass manufacture .....	18,355	22,354
Metals .....	521,547	608,539
Hardware and cutlery .....	139,661	179,861
Machinery .....	22,177	34,276
Salt .....	16,010	16,125

## PRICES OF MINING SHARES.

BRITISH MINES.				BRITISH MINES—continued.			
Shares.	Company.	Paid.	Price.	Shares.	Company.	Paid.	Price.
1000	Aberystwith	9	10	9000	South Tamar	1	2 1/2
1094	Alfred Consols	21	25	128	South Caradon	5	20
1024	Astrandell	21	—	1100	South Dolcoath	5	1
1024	Ashterton United Mines	9 1/2	12	256	St. Elizabeth, Wh. Ann	30	25 1/2
1624	Balkeewalden	9	14	256	South Holston	8	12 1/2
128	Baldon Consols	42 1/2	50	1024	South Plain Wood	1	5
905	Barristown	51	4 1/2	256	South Speed	8	5
3650	Bawden	4	1 1/2	256	South Tolgus	16	150 155
6000	Beaulieu	1	1	256	South Trevelyan	28 1/2	8
4000	Bedford	21 1/2	5 1/2	3000	South Wales Mining Co.	1	1 1/2
1500	Birch Tor & Viddler	104	6 1/2	256	South Wheel Basset	104	25 1/2
5000	Black Craig & Craigton	5	3	124	South Wh. Frances	160	400 450
5000	Blasgowton	30	10	256	South Wh. Josiah	3	3 1/2
5000	Blisland Consols	1	—	10000	Southern & Western, Irish	2 1/2	4
1024	Bodmin Consols	3	3 1/2	280	Spearne Moor	30	40
5000	Bodmin Moor Consols	1	3	128	Spearne Consols	10	60
60	Bosron	41	10 1/2	386	St. Aubyn and Gyllis	28 1/2	5
100	Botallack	18 1/2	7 1/2	94	St. Ives Consols	1	80
120	Brewer	5	2 1/2	128	St. Michael Peakivel	5	10 1/2
10000	British Iron, New, Regis.	12	8	959	St. Mliver Consols	1	1
1	— Ditto ditto, scrip	10	10	1000	Stray Park	43	25 1/2
2400	Bryn Arian	3	3 1/2	9600	Tamar Consols	3	6 1/2
107	Budnick Consols	52 1/2	12	10240	Tavistock Consols	1	2 1/2
260	Butterdon	1	2 1/2	1024	Tavy Consols	64	1 1/2
1000	Callington	22	5 1/2	6000	Tincroft	7	14 1/2
1000	Canabon Consols	7	3	58	Tolcarne	170	10
30000	Cannerton's Steam Coal	3	1	240	Tolgus	8	20 22
256	Caradon Mines	22 1/2	10	5000	Tolgore	1	1
256	Caradon United	24	5 1/2	256	Tregordon	3 1/2	7 1/2
1000	Cardona	5	12 1/2	256	Trehane	14	30 38
872	Caradon Wh. Hooper	54	4 1/2	5000	Treigh Consols	6	2 1/2
1000	Carra Brea	15	115 120	2000	Treanance	3	3
1000	Carthow Consols	13	7	1500	Treanant Lime Quarries	2	3
1103	Charlestown	23	5 1/2	56	Trevelyan	10	95
500	Comblaw	5 1/2	4 1/2	120	Trothellian	5	2 1/2
128	Confort	45	50	120	Treviskey and Barrier	130	235 240
256	Coudurrow	20	12 1/2	612	Trethvey Copper	2	2 1/2
2560	Cook's Kitchen	14	7 1/2	512	Treville (Lewannick)	2	5
1000	Coombe Valley Quarry	5	5	1000	Tyldwy	2	2 1/2
1000	Copper Beltton	7 1/2	—	200	United Mines	59	180 160
900	Court Grange	5	10	256	Wellington Mines	25	25 30
212	Craddock Moor	23 1/2	30	128	West Buller	10	425
128	Croog Brava	120	30	256	West Caradon	20	96
500	Culter Mine	124	—	512	West Fowey Consols	40	12
1000	Cwm Erfin	4	2 1/2	1024	West Par Consols	5	1
1000	D. ren	2	7 1/2	2500	West Polgoth	5	5 1/2
7100	Darwent	10	3	1	Ditto Notes	1	1 1/2
502	Devon & Courtenay Con.	11 1/2	2 1/2	512	West Providence	9	104 20
1024	Devon Great Consols	1	225 227 1/2	200	West Seaton	45	150
1000	Diarode	2	5	120	West Trevelyan	1	20
142	Dolcoath	30	20	512	West Wheel Frances	15	9 1/2
2560	Drake Walls	54	3 1/2	256	West Wh. Friendship	9	8
10000	Durham County Coal	45	9	3845	West Wheel Jewel	12	2 1/2
3000	Dyffrynwg	10	15	940	West Tolgus & Trevelyan	12	3
2500	East Birch Tor	3	3	1024	West Wheel Treasury	7	6 1/2
1024	East Buller	2	5 1/2	1024	West Wheel Virgin	4	5
3045	East Crowdale	7 1/2	1 1/2	1024	Whidson Mines	4 1/2	2
356	East Godolphin	10 1/2	1 1/2	3200	Wicklow Copper	5	13 1/2
4000	East Gwinn Lake Lane	2	4 1/2	5000	Wicklow Copper	3	3 1/2
128	East Pool	15	60 5 1/2		Sulphur Mines		
9000	East Tamar Consols	13	1 1/2	107	Wheel Adams	130	150
358	East Tolgus	15	1 1/2	1000	Wheel Agar	1	6
128	East Tywarhaye	1	2 1/2	256	Wheel Albert	10	38 29
94	East Wheel Croft	125	65	350	Wheel Anderson	28	9 1/2
128	East Wheel Rose	50	450 500	128	Wheel Anna	1	30 1/2
128	East of Scotland Iron Co.	2	4 1/2	512	Wheel Anna Maria	15	12 1/2
1280	Esquair Llan	2	4 1/2	120	Wheel Bal	5 1/2	12
248	Exmoor Wh. Eliza	11	10 1/2	256	Wheel Benny	14 1/2	2
494	Fowey Consols	40	45	1024	Wheel Bray	11 1/2	10
1024	Freid Lyddard Mines	13	3 1/2	2424	Wheel Calstock	9	10
256	Garras	41	24	256	Wheel Carpenter	1	7 1/2
4000	Gen. Mining Co. for Irel.	14	1 1/2	1 1/2	Wheel Courtenay	20	23
3500	Georgia Consols (Tin)	1	1 1/2	2 1/2	Wheel Elizabeth	15	12 1/2
256	Gonnamena	44 1/2	10	256	Wheel Fortescue	15	12 1/2
128	Goovrea	8	9 1/2	100	Wheel Friendly	70	66 1/2
256	Grambler & St. Aubyn	80	10 1/2	368	Wheel Franco	27	10 1/2
96	Great Consols	1000	250	1000	Wheel Grose	36	45
512	Gr. Wh. Rough Tor Con.	24 1/2	20	1000	Wheel Henry	1	35 1/2
6000	Grova Slate Company	3	3	6000	Wheel Langford	3	3
1026	Gustavus Mines	3	3	1024	Wheel Lawrence	2 1/2	3 1/2
256	Hawkmoor	124	70	112	Wheel Margaret	79	190
6000	Hedonshire Down Con.	21	2 1/2	512	Wheel Mary Ann	5	39 40
5000	Holbeck Silver-Lead	18	5 1/2	3000	Wheel May	1	2
4500	Honnock Iron & Tin	21 1/2	21 1/2	350	Wheel Oak	25 1/2	5
512	Holmfoot	16	14 1/2	3000	Wheel Penhale	14	6
10000	Ilberham	124	1 1/2	210	Wheel Prospect	4	7 1/2
1000	Holmbush	22	13	120	Wheel Reeth	41	75 80
2200	Kewick	10	10	108	Wheel Seton	107	240 50
1024	Kingstet and Bedford	11	4 1/2	1056	Wheel Sarah	4 1/2	7
747	Kirkcudbrightshire	8 1/2	5 1/2	512	Wheel Sophia	15	12 1/2
2000	Lanherone Wh. Maria	9	4 1/2	128	Wheel Squire (St. Erth)	1	5
128	Lanarth Consols	1	7 1/2	128	Wheel St. Ann	30	35
256	Leland Consols	47	25 26	1100	Wheel Trevelyan	6 1/2	7
160	Levant	1	160	256	Wheel Trevelyan	7 1/2	88 92
1000	Livynmales	9	10	257	Wheel Tremayne	9 1/2	21
3500	Liyavon Iron	3	50	257	Wheel Tryphena	40	62 1/2
253	Lostwithiel Consols	23	10	512	Wheel Vinton	5	8
6000	Marke Valley	10	4 1/2	1000	Wheel Vincent	5	5
5000	Mould Hill	33 1/2	3 1/2	128	Wheel Vlow (Perran)	14	14
128	Metha	34	1	184	Wheel Vyvyan	1	60
20000	Mining Co. of Ireland	7	5				
1024	North Buller	1	12 1/2				
100	North Pool	45	500				
140	North Pool	51	180				
262	North Wh. Lelsure	14	2 1/2				
512	North Wheel Vor	1	2 1/2				
15000	Northern Coal Co.	23	2				
128	Par Consols	55 1/2	650				
1026	Pendarves Consols	2	5 1/2				
1000	Pendarves & St. Aubyn	4	4				
1248	Pengelly Tin	1	1				
6201	Pennant & Craigwyn	24	2 1/2				
1500	Penzance Consols	5	12 1/2				
1024	Penzance Consols	22 1/2	4 1/2				
5000	Peter Tavy & Mary Tavy	3	1				
512	Plymouth Wh. Yeoland	6 1/2	6				
2500	Rhoswiddol & Bacheiddon	10	10				
10000	Rhyndyffryn Iron	50	13				
1000							
1000	Ditto New	7	6 1/2				
404	Rannaford Coombe Tin	12	24				
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## IRON MINES OF NOVA SCOTIA.

It is now nearly two years since public attention was first directed, through the medium of this Journal, to the remarkable iron mines of Nova Scotia, and from the facts which then came to our knowledge we felt convinced that the day was not far distant when large supplies of charcoal iron would be furnished from that quarter. We are now glad to have it in our power to report that a good beginning has been made, and we have within these few days seen iron and steel manufactured from the London-derry ores of Nova Scotia, which we are justified, by high authority, in pronouncing to be of first-rate excellence. Since the subject was first brought under our notice, the proprietors of the mineral district have had it carefully surveyed and explored, by several scientific and practical men, and amongst others by Mr. Hayes, the well-known American metallurgist and ironmaster. The reports and surveys of those parties are now before us, and amply bear out the opinion expressed by Mr. Hayes, "that charcoal iron, of a most superior description, can be made and shipped at this locality cheaper by far than in any other part of the world."

From the sources of information within our reach, we are enabled to state that the geographical position of these mines is most favourable for mining, for manufacture, and for transport. They are situated on the southern slope of the Cobequid Hills, which run parallel with the waters of the Bay of Fundy, and the veins and deposits of iron extend for many miles in the same course. These hills are intersected at right angles by numerous streams which fall into the bay; and, as the deposits crop out at an elevation of several hundred feet above the ravines, the mines may be worked and drained by adits and levels, without any expense of machinery. The ores of this district have been pronounced by the most competent authorities to be unequalled for purity and richness of yield; and it has been ascertained by experiments on the large scale that they are exceedingly easy of reduction, and furnish iron and steel of first-rate quality. These ores are very various, but the most remarkable are—1. The specular or micaceous-specular iron ore, having a specific gravity of 4.72, and yielding 70 per cent. of pure iron and 75 of cast-iron.—2. The oligisto-magnetic ore, a very compact variety, yielding the same proportions as the above.—3. The red ore, designated A 1, which yields 69½ per cent. of iron. Another variety yields 65 per cent. These three kinds, which are primary ores, have been proved to afford iron and steel of the highest quality, but in addition to these, there are various red, brown, and black hematites, besides carbonates and hydrates, which are admirably suited for the blast furnace; and the ankerite, a ferruginous variety of limestone, which occurs in great abundance in almost every part of the mineral range, whilst it affords an excellent flux, is in itself an ore of iron, and yields from 10 to 20 per cent. of a very pure kind.

Extensive beds of red and yellow ochres of excellent quality are also found in many places along the line. In point of quantity these ores are said to be quite inexhaustible; and in immediate association with them are boundless forests of wood and timber, with lime, freestone, fire-clay, and abundant water-power. Within two or three miles, coal of excellent quality has been discovered, and two veins, of 7 and 9 ft. wide, are now being worked. Labour can be had on very reasonable terms; and all the necessities of life are abundant and cheap.

We understand that it is the intention of the proprietors of this territory to form an association for the purpose of working these valuable mines, and manufacturing iron upon the spot. A part of the produce will be sent to market in the shape of pig-iron, and a part refined in charcoal fires, and exported in the shape of blooms and bars.

From all that we have seen, we feel entirely confident that Nova Scotia is capable of furnishing to the mother country a much larger supply of charcoal iron than she now derives from Russia and Sweden, and nothing inferior in quality, although at half the cost. It is a subject of congratulation to know that we may henceforth render ourselves entirely independent of foreign countries for our higher qualities of iron, and at the same time foster and develop the resources of our own colonies. With reference to the importance of an abundant supply of charcoal iron, Mr. Mushet thus expresses himself:—

To no country in the world is a supply of superior charcoal iron of such vital importance as to Great Britain, and yet for this essential article she is, and ever has been, dependent upon Russia and Sweden, whence the materials are imported, which produce the only kinds of steel which are fitted for supplying the various branches of manufacturing industry with implements and tools of that degree of excellence and finish, without which our manufactured products would, in most instances, degenerate into mediocrity, or even inferiority, as compared with the produce of other countries. Without first-rate steel England would speedily lose her station of pre-eminence amongst the nations, for what art or science can flourish without this essential substance; and if our supply of Swedish and Russian charcoal iron were now cut off, England possesses not within herself the sources from which she could produce a quality of iron to fill up the void, and to furnish steel adapted to meet and satisfy the endless requirements of her operative and manufacturing population. If, instead of the enormous supply of iron which is at present paid for by a scanty supply of this indispensable foreign iron, an equally excellent quality of iron could be furnished at half the present cost, what an impetus would not at once be given to the manufacturing energies of Great Britain! Such iron would supersede the common iron at present in use for many purposes of machinery, for ordnance and fire-arms, for steam boilers, for building iron ships, for tin-plate, wire-iron, for anchors and cables, suspension rods and chains for bridges, for tubular bridges, for axles of locomotives, for wheels and wheels-tires, and above all for railway bars. It being an indisputable fact, that best charcoal iron rails will endure more traffic without wearing, crushing, and laminating, than from four to five sets of coke iron rails, so that the former would prove the more economical, even at four times the price of the latter. It is an object of the deepest importance to all principal railway companies to obtain hereafter the means of relying, in a more permanent and substantial manner, their lines of road exposed to a heavy and increasing traffic. Charcoal iron alone can enable them to effect this most desirable improvement, and the province of Nova Scotia, the nearest of all our transatlantic territories, appears to possess, in an eminent degree, all the criteria, natural facilities and appliances, necessary to furnish a cheap and inexhaustible supply of this article, equal in quality to the finest varieties of foreign iron. The ores of Nova Scotia form an entirely new class, and there alone are found, in the midst of native forests, immense deposits of oxides of iron, existing in a state of absolute purity, instead of being associated, as is usually the case, with refractory and injurious admixtures of foreign substances. The rich but infusible ores of the United States will bear no comparison with the pure varieties of our highly-favoured colony of Nova Scotia, a country destined at no remote period to take a conspicuous lead amongst the iron manufacturing districts of the world.

Besides the extensive market which will be found in Great Britain for the Nova Scotia iron, great quantities will be consumed in the neighbouring colonies, and the United States of America. A vessel of large tonnage can load within five or six miles of the mines, and in one day she may reach the prosperous and increasing city of St. John's, New Brunswick, one of the greatest timber ports in the world. Another day or two will bring her to Portland, in the state of Maine, already linked to the Canadian and the far west by the St. Lawrence and Atlantic Railroad. Another day will suffice to reach Boston, and in two or three more she may deliver her cargo in the great emporium of the western world. The great number of vessels in the Bay of Fundy afford ready and cheap means of transportation to the last-named cities, or any others on the Atlantic coast. The price of transport to Boston or New York is not more than 5s. per ton. Iron can be transported to England from St. John's as ballast in timber ships, and as freight for 8s. per ton. From the mines to the excellent harbour of Wallace, on the Gulf of St. Lawrence, the distance is only from 18 to 20 miles, and a vessel laden at this port may, without breaking bulk, ascend the river St. Lawrence to the great lakes, and so reach the remotest parts of Canada and the states of Wisconsin, Michigan, Iowa, Ohio, Illinois, and the far west of America. During the winter season, the cost of transport to Wallace will not exceed 5s. per ton. It is worthy of observation, that the great line of railway from Halifax to Quebec is surveyed to pass directly through the centre of the mineral territory, which is already traversed by the main post road and the line of the electric telegraph, forming the communication between Halifax and the Canadian, New Brunswick, and the United States.

Our space will not allow us to enter further into details at present, but we shall from time to time revert to the subject, which we consider one of great interest and importance.

**COAL MINING IN THE FOREST OF DEAN.**—At the Gloucester Assizes, an action was brought, for the recovery of 512 5s., as rent for a colliery. The defendant (Roberts) denied the execution of the lease, and alleged that he had been induced to execute it by the fraud of the plaintiff (Sear). The main ground of defence was, that the colliery had been worked out before execution of lease. The evidence on this point was very conflicting, the witnesses for plaintiff stating that the pits found in the colliery were "old men's diggings," made very many years ago, and which merely cropped the seams; that they were evidence of there being coal in the deep of the mine rather than of its being absent; and that the use of the defendant's bad success was his own fault, in not having driven his level far enough, and in his roadway having fallen in by reason of the insufficiency of the timber. The witnesses for the defence, on the other hand, said that there was no coal to work; that the little which had been obtained was not worthy the name of coal; and that it had been found below the level awarded to the plaintiff by the Dean Forest Mining Commissioners, and, therefore, he had no property in it which he could derive. The evidence of fraud, however, was defective; and on his lordship expressing his opinion to that effect, and that it was a fit case for an arrangement, a verdict was taken, by consent, for the plaintiff, damages 40l., and it was agreed that the lease should be cancelled.

## PATENT TOUGHENED CAST AND MALLEABLE IRON.

We have, on two former occasions, alluded to the report of the commissioners appointed to inquire into the application of iron to railway purposes; and as there are some important points relative to Mr. Morris Stirling's patent toughened cast-iron which we have not yet touched upon, and as this description of iron ensures very great strength, and, therefore, considerable saving in weight, and consequent economy in expenditure, we now proceed to the consideration of the results of some of the experiments made on this iron. Mr. Eaton Hodgkinson, in investigating the subject for the Royal Commission, gives the following results. Bars of 10 feet long, and 2 inches square, the supports, 9 ft. apart, broke as follows:—

Blenavon iron, No. 3	1290 lbs.
Lowmoor iron, No. 1	1207 "
Bars cast at Warrington, composed as follows:—	
Madeley Wood, 8 parts	
Lillehall, 6 "	
Pontypool, 34 "	1276 "
Charcoal iron, 5 "	

Stirling's second quality—

Calder hot-blast, No. 1, with 20 per cent. of malleable scrap .... 2174 "

This iron is termed second quality, because a still stronger mixture, more especially for large castings, is produced, by employing a No. 3 iron with the requisite proportion of malleable scrap. In a series of experiments, made at the Dundyvan Works, and described at page 416, the strength of bars of this mixture of the same size as the foregoing, is shown to be much greater—the breaking weight being 2601 lbs. We may here remark how nearly the Dundyvan experiments correspond with Mr. Hodgkinson's, as the two series of experiments on No. 1 patent toughened will show:—

Hodgkinson	2174 lbs.
At the Dundyvan Works	2153 "
Ditto	2234 "

At page 9 we find the results of some experiments on the tensile strength of the same iron (No. 1), by Mr. Hodgkinson, to be above 12 tons per square inch; the average of 17 other descriptions of iron experimented on gave between 6 and 7 tons, showing thus an increase of nearly 100 per cent. The kind of iron, called Stirling's third quality, contained cinder, and, although stronger than any other iron tried by Mr. Hodgkinson, is not recommended by Mr. Stirling, and is not now made.

We have seen written communications from the owners of some large bar-iron works, stating that the toughened iron is found exceedingly well adapted for all the heavy bar-iron work machinery employed in the manufacture. Bolls and roll pinions, cast from it, are much sounder and stronger than those made from other iron; pinions especially give great satisfaction, as they stand the wear and tear of working longer than any others, and the stoppage of the machinery, which, under general circumstances, so frequently takes place, is avoided; also in the construction of cast girders, as by the use of this iron greater strength is obtained, with a large saving in weight.

At page 101 an abstract is given, showing the crushing strength per square inch, in which we also find Mr. Stirling's iron to be nearly 50 per cent. superior in strength to 16 other sorts of iron experimented on. We would here remark that, had Mr. Stirling's No. 3 iron been submitted to the same tests, the resistance to crushing force would have been very much greater. The opinions expressed by Messrs. Fairbairn, May, Thomas Cubitt, and other witnesses, who have made themselves acquainted with the subject, are of a highly favourable character. The iron bridge over the Thames, at Windsor, constructed under the superintendence of Mr. Page, and the cast-iron portions of the bridge erected at Yarmouth by Mr. J. Walker, are being made of Mr. Stirling's patent iron.

At page 417, an abstract is given of a number of experiments on the strength of Stirling's patent, and of common malleable irons, from which we extract the following:—

	Breaking strain in tons per sq. inch.
Average of Mr. Josiah Hartley's experiments at Liverpool, on many sorts of malleable iron	23.23
Average of S. C. Crown iron, from numerous trials at Woolwich Dockyard	24.47
Average of best Dundyvan bar	24.38
Average of Mr. Stirling's best quality	27.81
Ditto ditto another quality	27.7

We particularly call attention to some varieties of the patent malleable iron, which are remarkable for their extreme stiffness, both tensile and transversely, and which are recommended to form the wearing surface of rails, tires, &c., and for all purposes where such qualities as stiffness and hardness are desirable. We have ourselves seen fractured specimens of rails formed of common iron for the body, and the patent hardened iron for the wearing surface, in which the hard crystalline character of the latter gives decisive evidence of its high power to resist compression, lamination, and abrasion. The average stretch in 2 ft. of malleable iron, in round bars of 1 inch diameter and 2 ft. length, may be taken at from 3 to 5 inches, or from the table before us at 4½ inches. The average of Mr. Stirling's patent hardened malleable irons is none kind ½ inch, and in the other ½ inch.

The permanent set of the same sized bar as before given, of common iron, when loaded so as to show its resistance to transverse strain, may be taken at 2½ inches, while that of one variety of the hardened iron is 1.02 inch.

**ACCIDENTS IN COLLIERIES.**—During the months of July, August, September, and October, in the past year, we inserted numerous communications from Mr. C. Colwell, and replies, from various correspondents, on the subject of accidents in coal mines, their causes, and the best means for their prevention. Mr. Colwell suggested plans for at least experimental adoption, which were far from meeting the views of his opponents, and at length the hitherto controversy ceased.—Mr. Colwell protesting against what he considered ill treatment, his only object having been the benefit of the hard-working collier, and stating that he should embody his ideas, and lay them before the public in a small volume. We have received a copy of the work, which is entitled "Money & Life: A Review of Colliery Casualties, showing their Cause and Extent—the Paradox of Coalowners—the Concealment of Deaths in Mines—Inaccuracy of Returns by Coroners—Iniquitous Mode of Pillar Working—the Great Necessity for Government Inspection—More Shafts—and an Adequate Provision for Widows and Orphans of the Victims to Explosion." Whatever may be the merits of Mr. Colwell's book as a literary production, or as throwing any additional light on the causes or means of prevention of those awful calamities which we all so deeply deplore, of this we feel convinced, that the author's determination and perseverance in keeping the subject fully alive to the consideration of the public has arisen from a deep conviction that many of the accidents arise from the cupidity of coalowners; and that some legislative enactments ought to be made to give that physical protection to the working collier which other classes of the population enjoy. In the volume under notice, the author enters into a short history of the general manner in which collieries are worked, statistical details are given of the deplorable results of some of the most fatal explosions, and every argument which humanity can suggest is brought into requisition, to show that the Legislature are bound, by every moral and paternal consideration, to interfere, by appointing inspectors, who shall enforce such regulations in working and ventilating collieries as shall, to a great extent prevent at least the so frequent recurrence of such catastrophes.

**NEW PROCESS FOR ORNAMENTATION OF GLASS.**—Among the numerous scientific discoveries of the past few years, was one for the deposit of silver from its solution in nitric acid, by the action of the essential oils of cassia and cloves; thus enabling the manufacturer not only to really "silver" mirrors, &c., but to deposit on any uneven surface of glass, such as engraved subjects, the inside of vases, &c., a coat of silver; which process apparently opened an entire new field of art. Unfortunately, however, time has proved that the silver thus deposited on glass, probably from the presence of a portion of the acids employed in its solution remaining with it, in a few months becomes again converted to a salt, covering the mirror, or other article, with dirty brown spots, and its original beauty entirely disappears. A new process, however, has just been introduced by Mr. Kidd, of Poland-street; he has studiously avoided employing chemical action in the deposit, but by the application of an amalgam of mercury and platinum, thus effecting a mechanical deposit, he has been eminently successful in representing every description of fruits and flowers, by engraving them on the under side of the glass. When silvered, the effect is to make them appear to the eye as if they were in relief, or raised on the outside surface. So accurate is the process of engraving, by a number of minute needles in the lathe, that any lace pattern, or embroidery, may be represented with the utmost precision. The number of specimens of looking-glasses, toilet mirrors, door plates, fire-screen plates, work-boxes lined with engraved glass, chandelier drops, &c., now on view, are beautiful specimens of the success of the discovery, and are well worthy inspection. The looking-glasses are generally in richly-moulded gaiter percha frames. In addition to the above, the numerous specimens of plain engraved glass, without being silvered, in decanters, ale, wine-glasses, &c., are equal to any collection we have ever inspected, and do great credit to the taste and execution of Mr. Kidd's artists. We should add, that Mr. Kidd's silvered glasses never tarnish, and that their brilliancy will not be affected by time.

## Original Correspondence.

## GRANULATING LEAD.

SIR,—In your Journal of the 16th March, under the head of "Notices to Correspondents," I observe a method for granulating lead. The following process is generally practised in Germany, and considered the best and most useful for granulating that metal for silver assays and other purposes. The lead is to be brought into fusion nearly of a shining red colour, which must be done in an iron pot. A small quantity of fused lead is then to be poured by a ladle on a wooden trough, about 24 inches long, 18 broad, and 2 thick, which is so hollowed, that the excavation in the middle is about an inch in depth, and of the form, as near as possible, of the segment of a circle; on the surface is placed a layer of chalk, to prevent the smoke, and the conversion into charcoal of the wood. A simple wooden trough, 24 in. by 18, will be found likewise useful for this purpose. The trough must be taken in both hands, and set in motion, so that the right hand goes towards the body, and the left from it, and on the contrary, until the centre of the trough is about its vertical axis, the trough must be then violently shook, and the process of granulation will be gradually developed. When the lead begins to cool, a species of crystallisation is observed, the lead appears to become thicker; at this state of the process the metal is semi-liquid, the lead must then be forcibly thrown from the further side to the trough, to that nearest the body; shortly afterwards it must be thrown in the air to a height from 1 to 2 ft. The lead so thrown up is again caught in the trough; by this manipulation, lead of a very fine grain will be obtained. A little exercise, and the absence of all timidity in performing the operation is essentially necessary. The separation of the smaller grains from the larger is subsequently done in sieves prepared for that purpose.—G. T.: Tyndrum, North Britain, April 6.

## PLATINA FROM GUADALCANAL.

SIR,—Having, sometime ago, seen and purchased from amongst a broken collection of minerals upon a stall near Lincoln's Inn-fields, a mineral specimen, upon which was a dirty and scarcely legible label, with the inscription, "Silver Ore from Guadalcanal," and having been experimenting on silver and other metallic ores, I was induced to treat this specimen also. Accordingly, having reduced it to powder, and calcined it, I treated it with successive portions of potassa, whence I obtained a scoria, containing iron and lead, and a button of metal, consisting of platina, silver, copper, and antimony; the copper and antimony I separated in the process of cupellation, leaving the silver and platina, which I parted from each other by nitric acid, which left a dark pulverulent mass by filtration, which being well washed and ignited, assumed the metallic lustre of platina; which, having assured myself of its identity, I weighed and found to be 8.78 per centum of the clean ore, the silver being about 7 per centum of the whole. As I have nowhere seen, nor read in your Journal, in the notices of the silver mines of Estromadura, any account of the ores of Guadalcanal containing platina, and especially in such large proportions, I have thought it right to send you this account for the perusal of those of your readers to whom it may be interesting. I have not reserved any portion of the specimen, thinking that more of it could be obtained if requisite, and having seen it once, I should have no difficulty in again identifying it, if presented for that purpose. I suspect, from its appearance, that it is rather a refuse and neglected mineral at Guadalcanal, somewhat like the kupfer-nickel of the olden German copper miners, and simulating, by its neglected treasures, the auriferous gossans of the Cornish lodes. Laboratory, Regent-street, Lambeth, April 8. W. RADLEY, Ch. E.

## THE SCOTCH PIG-IRON TRADE.

SIR,—It is with much astonishment I observe, from time to time, such various, and I may almost say conflicting, statements of the Scotch pig-iron trade, and it must be admitted that there is a want of real information on some points respecting it, which would be highly useful to be known. Some pamphlets have been lately published relating to it; and, after minute inquiry, I certainly must agree with the statement of the production for 1849, as given in one of them, I believe written by an eminent iron-master:—viz.: 620,000 tons; which quantity may be increased to 640,000 tons, should all the furnaces now in blast continue so throughout the year. It is asserted by some that the present prices of iron must be remunerating, as the production has increased so much of late years; but it appears to be quite forgotten that it was the high rates of 1845, 1846, and 1847 (in 1845 the price touched 6l. per ton) that stimulated enterprise, and induced parties to seek out new mineral fields and erect furnaces, which they now regret having done, being compelled in a measure to go on, having fixed lordships, or royalties, to pay, and capital invested. The increased cost of the mineral is also a matter of serious consideration, as it must, in some instances, be brought from a great distance, and in others deep and expensive mines are now sunk, where formerly the mineral was obtained near the surface; and there can be no doubt by those well informed on the subject that the rates ruling during the last two years have not been remunerative. Average price in 1845, say, 4l. per ton; 1846, 3l. 8s.; 1847, 3l. 6s. The above were the prices which gave an impulse to production, and gave birth to the Lugar, Forth, Kinnell, Eglinton, Dalmellington, Portland, Lochgelly, and Nithsdale Works (the last not even yet in blast), as also the large extension of the Glegarnock Works; and it should be remembered that, notwithstanding such prices, the Blair Works could not be continued, and the results of their operations proved disastrous to the parties engaged; and although these furnaces, &c., have been in the market at a very reduced rate, they have not met with purchasers.

Another view may be taken. If the statistics of the trade are referred to, it will be seen that the average price for the five years—say, from 1840 to 1844 inclusive, was 3l. per ton; 1845 to 1849, 3l. 1s. 6d. per ton, what will be the average price for five years, say 1848 to 1852 inclusive, taking the last two years as a criterion? May it not be feared, with too much reason, that unless the demand is sufficient to raise the price permanently, instead of an increase of production, and, consequently, good employment for the operatives, a decrease will and must take place ere long.

April 3. A SUBSCRIBER.

## VOLTAIC COPPER ASSAY.

SIR,—I fear that in my communication on "Voltaic Copper Assaying," published in your Journal of the 23d March, I was not sufficiently explicit in my description of the instrument used in the assay, or I am inclined to believe Mr. Pridaux would not have supposed it to have been imperfectly constructed. It is simple, cheap, and better adapted to voltaic assaying than any apparatus I have yet used. I shall, however, be glad to see the results of his experiments, but more especially the details of his apparatus and mode of operation, which will, I doubt not, be found more perfect than anything on the subject of voltaic copper assaying that has yet appeared. I hope to forward you the results of my experiments on Pelouze's method of assaying next week.

With respect to the wet assay, the water was boiled in a corked bottle, but it was not used quite cold, nor was the zinc kept in during washing. No filter having been used, the precipitate was repeatedly washed, dried, carefully heated, and weighed. It is probable that the precipitated copper absorbed a little oxygen whilst drying; for, on a subsequent experiment, having filtered the solution, ignited the filter, and melted the produce with black flux, the fine button of copper produced ½th less than that of the former process, differing but ½th per cent. from the voltaic assay.

I am obliged by Mr. Pridaux's suggestion relative to using iron instead of zinc as a precipitant; but in my experiments I have found zinc preferable to iron, because it has given more accurate results. The ore of which I have given the analysis was previously tested by the blow-pipe for other metals that zinc throws down. The carbonaceous matter liberated from the iron during its solution, and the minute particles of metallic iron, frequently found mixed with the precipitated copper, makes the produce always above what it ought to be; the former, however, would be of no consequence, provided the produce be reduced as above described. If Mr. Pridaux can tell me how to obviate small particles of iron from mixing with the copper, or removing these particles, except by the tedious process of using sulphuric acid, or the magnet, I should feel particularly obliged.—J. PRINCE: April 11.

## COPPER SHEATHING.

SIR,—When this question was first mooted, in addition to some remarks on the quality of Norwegian copper, I mentioned that, if possible, I would obtain from Mr. Stromeyer some opinion of the smelting process, as practised in reverberatory furnaces. In a letter, he states—"I made the analyses chiefly to get an insight into your process, which differs more than it seems at first from the operations of the blast-furnace. I greatly doubt whether, without a number of analyses, the real loss of copper could ever



be discovered, and I much doubt whether the loss is so great as generally stated. Regarding the slags, I find but little cobalt; but I think it should be seen whether the nickel contained in the Alten blister copper and refinery slags cannot be extracted with profit. I think it would be feasible to prepare it in a pure state; but the expense would be considerable, and a great deal of apparatus required. I think an alloy of copper and nickel could be made from them, and offered for sale to the manufacturers of German silver. Such an alloy is, I believe, now made at several copper-works, more especially at Klevahytte, near Calmar, in Sweden. As nickel is only used for German silver, such an alloy will probably suit the manufacturer quite as well—probably, through some correspondent, information might be obtained on this head. I have tried the experiment with the black copper slag, smelting it with 20 per cent. of limestone, in a crucible lined with charcoal. The regulus I got contained 6 per cent. of nickel, 5 of iron, and 89 of copper; melted again with a little nitre and borax, it then contained 10 per cent. of nickel, and only one-half of iron; such a composition, I think, would be very suitable for the manufacture of German silver. If the blister and refinery slags are smelted together, limestone would probably not be necessary, as the protoxide of iron in the blister slag is in abundance. If the fusion was conducted briskly, and the slag mixed with a proper (not too great) proportion of charcoal, or coke, free from sulphur, I think the protoxide of iron might be prevented from reduction, and retained in the slag. However even, as in my small trial, an impure metal can be got at first, the success which I had in purifying shows that a refining process, where the oxygen of the air and the silica of the bottom play the part of the nitre and borax in my experiment, will be able to get rid of the iron, and enrich the alloy in nickel by oxidising part of the copper. Should this succeed, as I anticipate, the question is how far should it be enriched in nickel? In the manufacture of German silver, 50 per cent. of copper is combined with 20 or 25 of nickel, and the remaining proportion zinc; this gives alloys of copper and nickel with 28 or 33 per cent. of the latter. If this could be effected, it would be very advantageous, as the manufacturer has then only to add the zinc; a lower per centage perhaps, however, would be better. The alloy would not, I suppose, be paid for at so high a rate as the pure nickel. The Swedish works are said to get a good price, about 1000 rix-dalers banco (84½ the skilling) (320 lbs. avoirdupois). The works are the property of Bergaards Ascham. How much nickel could be obtained from the slags, it would be imprudent to state decidedly. As the produce for last year was 203 tons of blister copper at 1·6 per cent. of nickel, this would give 3·24 tons. This is too uncertain to depend upon, and a few trials which might be done at a trifling expense would enable the proprietors of the Alten Works to proceed with security. It will at first be difficult to know where to stop the refining, in order that the nickel should not again be dissipated. A piece may be dissolved in nitric acid, and ammonia added when no oxide of iron remains; but the difficulty is to discover how much nickel is in the metal. As, however, the nickel blanches the colour of the copper very powerfully, perhaps it would be as well that a scale of alloys of successive per centages of nickel should be prepared, and the colour of the metal compared, under the course of refining, with it.

Perhaps Mr. Pridmore, or some of your correspondents, might be able to give some information as to whether the nickel contained in the copper has been one of the causes which has rendered the Norwegian copper so durable, and whether the extraction on a large scale would meet the expenses.—GERMANICUS: Paddington, April 10.

#### COMETS.

SIR.—Having propounded a new theory of comets in the *Sunday Times* in 1836, and since in other papers, at times when these phenomena have excited public attention, without any notice being taken by any leading authority on such matters, and as the "great comet" is expected, the following explanation may be entertained by some of your readers. My rationale of these wonderful phenomena runs thus:—By holding a double convex lens edgewise between a light and a wall, as a proper focus, and revolving it slowly, a faint nebulousity will make its appearance on the wall; the projection of a tail with two diverging streams of light, with a brilliant nucleus, exactly representing all the appearances of comets will be seen. Similar effects come from similar causes; it is reasonable therefore, to suppose that comets themselves come from similar natural causes. The direction of the tails decides the sunlight to be the primary cause, which matches with our artificial light. Now, for the lens, we must look for something in Nature to take the place of it between the sun and the real comet. The atmospheres surrounding the planets are refractive, and, like lenses, project streams of light, form nuclei, and all the changes described above, as seen by using a lens. There are always planets to be found in conjunction, or directly interposing, at the times of these appearances, and to them only can we assign the effects of a medium. Their varying velocities are readily accounted for by this hypothesis, by the nearness, or greater distances, of the planet, or planets, in an inverse ratio. Instead of running a course for centuries, and then returning to our universe, they disappear as the refraction ceases, and the planetary medium swerves in the revolution of the planetary bodies, and re-appear when the refractions from conjunction are repeated. The only argument raised against this theory is that, in producing the appearances of comets by a lens on a wall, we have a solid surface to cast them upon, which we have not in Nature for comets to appear upon; but it is readily answered by the rainbow. There is no plain surface to receive it, and yet the medium of a shower of rain projects the visible bow upon the atmosphere as perfectly as we can imitate the rainbow on a wall by a prism. The rationale of comets is simple and comprehensible, and with the prognosticated return of the "great comet," I would ask the highest authorities, if they calculate the position of our planetary system at the time of the appearances of comets, whether the theory is not fully substantiated on all occasions without exception?

April 4. ARTHUR PARSEY.

#### THE REWARDS OF GENIUS.

SIR.—In the *Mining Journal* of the 16th inst., p. 129, you say that "the most noble inventions that ever entered into the mind of man, or contributed to the weal of the human family, have been received with the greatest amount of ridicule—have been most cruelly persecuted;" and the remark is just. We have heard that a Harvey lost his practice through discovering and promulgating that the blood circulated in the body—that the Royal Society laughed at Franklin's discovery of the identity of lightning and pyrogen—that the Paris Academy of Sciences condemned Fulton's great invention—that it was pronounced that steam-vessels could not cross the Atlantic—and that Ericson's screw propeller was condemned in this country, with numerous other instances of a similar nature. But the following letter, from Miss Costello's *Summer among the Boscages and Vines*, tells the most lamentable story of the kind I ever met with:—

"Paris, Feb. 1841.  
"MY DEAR EPISTOL.—While you are forgetting me at Narbonne, and giving yourself up to the pleasures of the Court, and the delight of thwarting M. le Cardinal de Richelieu, I, according to your desire, am doing the honours of Paris to your English lord, the Marquis of Worcester; and I carry him about, or rather he carries me, from curiosity to curiosity, choosing always the most grave and serious, speaking very little, listening with extreme attention, and fixing on those whom he interrogates two large blue eyes, which seem to pierce to the very centre of their thoughts. He has even written a book on the subject, which I have here. Lord Worcester, who had listened to this account with much interest, after reflecting a time, asked for the book, of which, after having read several pages, he said:—'This man is not mad: in my country, instead of shutting him up, he would have been rewarded. Take me to him, for I should like to ask him some questions.' He was accordingly conducted to his cell; but, after a time, he came back sad and thoughtful. 'He is indeed mad now (said he), misfortune and captivity have alienated his reason; but it is you who have to answer for this madness; for, when you cast him into that cell, you confined the greatest genius of the age.' After this, we went away; and, since that time, he has done nothing but talk of Solomon de Caus.

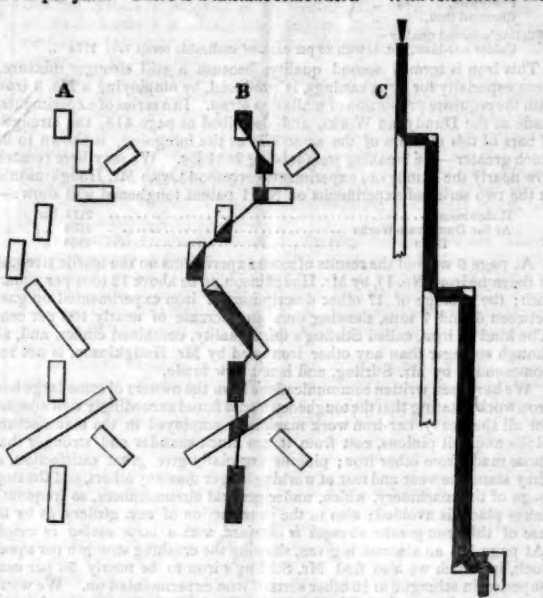
"Adieu my dear friend and faithful Henry. Make haste and come back; and pray do not be so happy where you are as not to keep a little love for me."  
"MARION DELAMORE."

Poor de Caus! What interest would his book possess could it be recovered. The letter is also highly interesting in another point of view. It gives a fine description of a nobleman whose name stands prominent in the history of the steam-engine, and, at the same time, casts some degree of suspicion upon the originality of his inventions. It would be singular, indeed, if, on further investigation, it should be found that he got them from the unfortunate maniac of the Bicêtre.

JOHN J. LARK.  
Ordinance Office, Portsmouth, March 26.

#### LIGHTNING CONDUCTORS.

SIR.—I quite agree with Mr. Lake in considering iron as a fit material for the construction of a lightning rod, if the metal be present in sufficient quantity. With regard to the conductor erected on St. Paul's Church, Huddersfield, if it be, as Dr. Murray states, "copper piping, half an inch in diameter, and the metal half an inch thick," then every reader of the *Mining Journal* must be well aware that it must have cost more than 12. 7d. per yard. There is a mistake somewhere.\* With reference to the



"improvements" alluded to by the Rev. Theodore Dury, it need only be observed—let the conductor be of a sufficient size, and insulation is quite unnecessary.

The experiments of Sir Snow Harris, as exhibited in the above diagram, are very instructive in connection with this subject. A, represents a number of detached pieces of gold-leaf; B, the same, after having been submitted to the action of a disruptive discharge. The shaded portions show the actual path taken by the electricity, as marked by the deflagration of the gold-leaf. The same phenomenon is exhibited in the same way in the diagram, C—a single piece of leaf being made the subject of experiment. Dr. Murray states that he preserves the copper rod at Huddersfield in all its integrity, by defending it on galvanic principles—namely: by ribbons of zinc at specific distances, insulated by slips of leather, and united with the copper rod by copper wire. He will correct me if I am wrong; but this arrangement appears to me like placing a man upon an insulated stool, and then, while he is so situated, bringing him into good conducting communication with the earth by means of a copper wire. The "galvanic protector," however, under any circumstances, is of no avail, except in wet weather, or when the temperature of the lightning conductor is at or below the dew point.

I could say much more upon the subject if time permitted; but I cannot conclude even these few passing remarks without referring to the recent melancholy loss of the American brig, *Lincoln*, by lightning, on the 2d of last month, in latitude 4° north, longitude 25° west. It is only another instance added to the many which have already occurred of the culpable neglect of shipowners to avail themselves of those certain means of protection which science has placed at their disposal. Had it not been for the providential appearance of the *Maria Christina*, of Altona (the very city, by-the-by, where Mr. Shepherd's experimental despatches were last distributed), every soul on board would have perished; and all this loss and danger for the mere want of a lightning conductor—a simple piece of metal, whose protective power is universally acknowledged, and which might have been purchased any where for a few pounds.

April 10. ISHAM BAGGS.

#### PREVENTION OF THE RAVAGES OF DRY ROT, &c.

SIR.—Your *Journal* of the 26th January last, contains a notice of the death of Mr. John Howard Kyan, the well-known inventor of the process for preserving timber from dry rot. But little more than two short months have passed away since the appearance of this announcement, when Dr. Murray comes forward with, I cannot help thinking, unbecoming precipitancy, to decry the merits of Mr. Kyan's most useful invention, and to direct attention to his own claims, in connection with the preservation of timber. As a friend and a relative of the late Mr. Kyan, I cannot allow Dr. Murray's observations to pass altogether unnoticed, although I feel assured that the refutation of his statements is unnecessary to the mass of your readers. I will endeavour to show that the letter in question is inconsistent, and contrary to known fact. The chemical preventive employed in the process of Kyanising is a solution of corrosive sublimate (bi-chloride of mercury), and the office performed by this solution is the precipitation of the albumen of the wood. Dr. Murray denounces the application as inefficacious; and, in proof of the correctness of his position, he refers to the opinions and experiments of Sir John Barrow, the Duke of Portland, Earl Manservants, and Dr. Moore; nay, he even declares that "it is sheer assumption to say that dry rot has to do with the albumen of the sap." Almost immediately afterwards, comes the following sentence:—"It may be added, that I had proved experimentally that chloride of copper would coagulate albumen, and, therefore, that this property did not exclusively pertain to corrosive sublimate, consequently, that it might be substituted." Substituted for what? for that which, according to his own showing, is absolutely worthless, and whose efficacy, as a precipitant, it is "sheer assumption" to dwell upon. So much for consistency! But Dr. Murray goes further than this. He says, "Sir Humphrey Davy had selected chloride of mercury for a similar purpose; but very properly abandoned it, from a conviction that it would form a deleterious and destructive atmosphere of mercurial vapour. I ventured to oppose it on the same ground, contending that, in tropical climates, it would be as poisonous as the quicksilver mines of Idria, in Illyria, &c.; and it turns out that I was quite correct." If Dr. Murray will have the kindness to inquire a little further, he will find that it has turned out just the reverse. The *Samuel Enderby*, that fine vessel, which left these shores last year for the Auckland Islands, is a case in point. Every timber of this ship, together with the sails and rigging, were originally Kyanised; and now, after 16 or 18 years' service, she proves to be not only perfectly sound, but perfectly healthy! With regard to the latter point indeed, Dr. Faraday, whose known care in the expression of an opinion, it is needless to dwell upon, affirmed, years ago, that he was so convinced by experiment of the innocuous character of the application, that he should not have the slightest objection even to wear clothing which had been Kyanised. [For the more detailed opinions of this illustrious philosopher upon the general efficacy of this process, see his treatise *On the Practical Prevention of Dry Rot in Timber*, published 1833.] But Dr. Murray denies the efficacy of the system! I myself saw two pieces of the same block of oak—one of which had been Kyanised; the other left in its natural condition. They had just been removed from the fungus pit at Woolwich, after lying there for five years; and attached to each were the seals and certificates of the dockyard officers. The prepared piece was nearly as hard as iron; the unprepared, mere touchwood, which crumbled to pieces between the fingers. But there is no necessity for me to rest upon individual experiments, indi-

vidual opinions, or individual demonstrations. If your correspondent will extend his inquiries to North America, he will find that the process of Kyanising has been very extensively and successfully adopted throughout the Union—not only in shipbuilding, but in railway engineering and general architecture. Even here it has long been most extensively used for the two last-named purposes; and to my knowledge, within the last 12 months, the late Mr. Kyan received written assurances of its efficacy from Mr. Robert Stephenson, Mr. Brunel, Mr. Locke, and other eminent engineers, and men of high standing. With regard to Dr. Murray's system of preserving timber by impregnation with sulphate of iron, your readers have yet to learn where it is to be seen in full operation, "triumphing over all others, even patent plans and projects." If Dr. Murray alludes to Payne's patent process, I beg to say that that process does not rest for its efficacy upon sulphate of iron, but upon the products of double decomposition, arising from the successive impregnation of the wood with sulphate of iron and muriate of lime.

An objection to sulphate of iron has been raised by M. Breaud, in consequence of its property of being decomposed into insoluble sub-sulphate of iron, and free sulphuric acid, by the woody fibre, which combines with the sub-sulphate—the free sulphuric acid corroding the timber, and causing it to become almost pulverulent.—ISHAM BAGGS: London, April 9.

#### RAILWAY ACCIDENT—PULVERIZED CHALK.

SIR.—I was sorry to hear of the accident which occurred at the Plymouth station, on the South Devon Railway, and I fear similar accidents must again occur under similar circumstances—namely, when the rails are wet and greasy, and the breaks overpowered. It is obvious that the sprinkling of sand on the rails, from the engine sand-box, is useless; consequently, I beg to call the attention of your readers to the use of pulverized chalk, as a substitute. I have made several experiments on a small scale, and I find, if pulverized chalk is sprinkled on the rails, the friction will be materially increased, as the chalk would be carried to the breaks, and render them efficient in all weather; and, further, chalk will increase the friction between the rails and driving-wheels in ascending heavy inclines.

April 5. G. SHEPHERD, C.E.

#### THE GODWIN AND TONGUE SANDS.

SIR.—I observe the letter of your talented correspondent, Mr. Shepherd, respecting the immense sacrifice of life and property on the Godwin Sands during the last four years, which, had his plan been carried into effect, when proposed, doubtless, would have been in a great measure obviated. I cannot but believe it possible to erect a lighthouse on those sands upon that principle, which, as he was the first to propose, I have no doubt, if confided to his care, he will effectually carry out. The plan is not only ingenious, but practical. It is a plan which has been found effectual in sinking through running sands, when all other means have failed. Could not a company be formed to erect lighthouses on those dangerous sands? The numerous underwriters, so greatly interested in their erection, must be apathetic indeed if they do not render Mr. Shepherd every assistance. The distressing facts in his favour ought to induce him to persevere. If he does, there is no doubt he will yet receive the thanks of thousands for his benevolent and honourable exertions.

Observer.  
Stourbridge, April 11.

#### THE CULTIVATION OF THE SILK-WORM.

SIR.—Among my numerous exploits and contrivances to serve the interests of my country and benefit my species, the cultivation of silk powerfully attracted and rivetted my attention, and as being specially pertinent to, and available by, the Channel Islands, Ireland, and the West Indies, and with our colonies generally.

My intelligent and worthy friend, M. Escher de Berg, of Switzerland, was kind enough to procure and send me, from Italy, two ounces of the eggs of the silk-worm, but my stock of mulberry-leaves failed me, and I ultimately abandoned the enterprise. I had obtained sufficient data, however, to guide my purpose, and enable me advisedly to recommend, for general adoption, the culture of silk and the silk-worm in the British colonies.

In 1838 I published a second edition of my work on the silk-worm; and that amiable and excellent nobleman, Lord Glenelg, then Secretary of State for the colonies, obtained 100 copies of that work for distribution among the governors of the colonies and British dependencies. This led to interesting correspondence, particularly with Mr. Burke, of St. Kitts, West Indies, who had successfully reared the silk-worm, and cultivated silk on that island, and where, as he informed me, the mulberry grew with a rapidity and luxuriance altogether extraordinary. Thus were my anticipations realised, as to eventual success.

I was not, however, permitted to enjoy the fruits of my exertions undisturbed. A person of the name of Felkin, a hosiery of Nottingham, endeavoured to despoil me of my rights, and, by a bold self-appropriation, denude me of the merits of my labours in this, my exclusive field of enterprise. I happened by mere accident to attend a lecture Felkin delivered on the subject, at Birmingham, and this led to the detection. In verification of my "just and righteous" claim, I beg to quote the following extract from a letter addressed to me by J. Dornig, Esq.:

Liverpool, June 14, 1841.  
I am this morning in receipt of the *Galloway Register*, containing your two letters on Mr. Felkin's attempt to appropriate your work on the silk-worm. I shall have great pleasure in forwarding it by to-morrow's West Indian packet, to the Editor of the *Royal Gazette*, Kingston, Jamaica, and will mark the two letters, so that he may discover the portion he is required to notice; and I trust he will make them known to his readers; and, also, the fact, that Mr. Felkin was not the first to sound the *velutin*, either in that island or elsewhere, on the project of the cultivation of the silk-worm in our West India colonies, or to extend the same in other climes. A copy of your work was transmitted in October, 1838, to the same editor. "Of Mr. Felkin's presumption, it may, apparently, from your letter, be said, *Cœsus inter montes evit*. If (as I infer from your rejoinder to him) he has assumed that Sir C. Metcalfe has not seen your work since he became governor of Jamaica, he is mistaken; for I have seen a letter, in Sir Charles's own hand-writing, dated Jamaica, 3d June, 1840, acknowledging and expressing his thanks for the receipt of a copy sent to him 9th January, 1840, along with several other of your works, whereof he states, 'I shall endeavour, by a careful perusal, to extract from them anything that may conduce to the welfare of Jamaica.' I can state, of my own knowledge, that the extensive gratuitous distribution of your work (by a now-resident planter) to all the most influential members of the *House of Assembly*, the planters, Agricultural Society, and Literati of Jamaica, and also to Sir Lionel Smith, the former governor (sent him in October, 1838), as well as to Sir Charles Metcalfe, the present governor, must have been, I conceive, immediately instrumental in causing the grant of 50,000l.

I wish this, however, to be merely introductory to another fabric, more curious than silk, the manufacture of another caterpillar—the *Tinea*.

Portland-place, Hull, March 26. J. MURRAY.

#### THE FABRIC OF THE TINEA PADELLA, &c.

SIR.—In my former communication I introduced—  
"The worm that spins  
A queen's most costly robe."  
I am now to commend to your notice a tiny caterpillar, that not only spins the thread, but weaves the web, and fashions it into form—a copy of the assigned pattern.

These curious manufacturers and artisans are the *tinea padella* and *tinea eunymella*. The former is the common "ermine moth," and their natural food is derived from the leaves of the *prunus padus* and *eunymus europæus* (common "spindle tree"). The caterpillar of the *tinea* is by no means uncommon. I have seen it in abundance in the hedge-row in Guernsey, and I remember to have witnessed, in the vicinity of St. Peter's Port, the foliage of an *eunymus europæus* being thickly covered with them. At Mount Loftus, near Cork, some years ago, the branches of an *eunymus europæus* was weighed down with the numbers of this caterpillar, and it was computed that there were half a million at active work.

I now venture to submit to you the translation of a letter addressed to me by Lieut. Hebenstreit, of Munich, dated 21st March, 1840, descriptive of the operations of these curious caterpillars, and of his ingenuity in securing their services. I may now merely add that, in the ateliers of Lieut. Hebenstreit, these caterpillars have formed balloons 4 ft. high, and 2 ft. diameter, each weighing 5 grs! Among their achievements was a robe for the Queen of Bavaria, to be worn over her court dress; the weight of this robe was about 20 grs. I have two lady's scarves, which were sent to me in a letter; one of these was 3½ ft. long, and 2 ft. wide, and weighed 8 grs.; and the other 3 ft. long, and 2 ft. wide, and weighed 7 grs.

Portland-place, Hull, March 27. J. MURRAY.

By desire, you will find enclosed the caterpillar web; a balloon cannot be sent in a letter. There are in all but three specimens left, as the last of the 13 ever prepared, or extant, and there will be no more of the kind exhibited by me. Nobody has any, except the Academy of Sciences at Munich, the King, the first families, and Baron Ross, at Berlin. I am already too old, and afraid prevent my ever occupying myself with such troublesome, and, therefore, costly, things for the future, although I formerly enjoyed it so much. In cases you should feel inclined to try the experiment, I give you a short account of it. The caterpillars are of the kind which are to be found on the *prunus padus* and *eunymus europæus*, and are called *tinea padella* and *tinea eunymella*. These are, of all the scabious hedge caterpillars I know, the most useful to make choice of; they have the property of not being able to move from place to place without first laying down a thread on which they can climb. In the first period of their life, as long as the leaf of the shrub is green,

\* The mistake referred to by Mr. Baggs is rectified in a letter which has been subsequently received from Dr. Murray, and inserted in another column of this day's *Journal*.



they are most useful; they like the light side, are generally voracious feeders, and abominate oil; therefore, by hunger, light, and oil, are easily managed. If one has the opportunity of collecting in the spring so many of these caterpillars together that a space may be covered with them in the proportion of 4 or 5 square inches per caterpillar, it is quite enough for them if they must be fed only twice a day, which is generally done morning and evening. The models may very well be made of packing paper, hanging freely. The caterpillars are placed on the upper side of the model, where also the leaves for feeding must be given. It is best, when any is to be produced (suppose like the annexed rough sketch) to hang round the various models, to be able to give the different light sides. Where the models are attached, the strings must be oiled, that the caterpillars may not escape. From eight to ten days afterwards the web will already be so strong, that it may be taken away. You first take away the caterpillars, and whatever else there may be, with a fine hair pencil, very carefully; you then cut in a straight line, with a penknife, lengthways through the web, and then draw the model away, which must directly after be replenished with caterpillars, and so on, as often as you please. This is the principal work in weaving of the web, which may, after a little practice, be varied at pleasure.

## THE SHIPWRECK ARROW.



Sir,—It is natural that I should wish to stand upright in public estimation, and the adjustment of rights claimed, when infringed upon, is better effected during the lifetime of the individual, than when "we go hence and are no more seen." But my main object is to show by what an uncertain and precarious tenure we possess our property in the empire of mind, however honourable may have been the course of action, and freedom from selfish principles. It will tend to illustrate facts already referred to, and but obscurely developed. I scarcely know of a single invention or discovery of mine that has not been pirated, plundered, or appropriated, without acknowledgment—save and except my *Life Boat*, and *Machine for Inflating the Lungs in Apparent Death*. I presented the latter machine to the Royal Humane Society.

The shipwreck arrow, referred to in a former communication as embracing the same principle used as a primary agent in Phillips's "Fire Annihilator," but used here for illuminating the path of the arrow and scene of shipwreck in the dark and tempestuous night, consists of a short gun, with a series of iron arrows; to the arrow is attached the line, which is projected from the ship to the lee shore. From experiments actually made, the arrow can be propelled to a distance of 150 to 200 yards, and it can be discharged either from the mast head or the deck of a ship in distress, or vice versa, from the shore.

It may suffice to add, that the "National Institution for Saving from Shipwreck" established this apparatus on the Sussex coast, and a set was also attached to the life-boat at Whitby. My work descriptive of the invention, with an illustrative plate, was published in 1831; and a few months afterwards I printed a supplement to the work, descriptive of new and additional experiments.

The following letter, addressed to the Editor of the *Hull Rockingham*, dated 18th March, 1835, is a sad proof of human delinquency, and amply illustrative of my premises. The sequel is melancholy: Blanch, who once had a promising business in Hull as a gunsmith, was obliged to leave in consequence of this exposure, and has learnt long before this period, if yet alive, the full force of the trite, yet true, proverb—"Honesty is the best policy."

Sir,—Repeated advertisements and paragraphs having appeared in your paper, in which Blanch claims what he is pleased to call his "Invention," at one period, and at another designates as an "Improvement of Professor Murray's," of Edinburgh, portable form of Manby's Apparatus. I trust you will be so good as to insert this letter, since your commendatory and laudatory paragraphs have been freely copied and circulated in other newspapers.

Who the "Professor Murray, of Edinburgh," may be, I presume not to know; but, I believe, none at present resident in that city is entitled to the distinction—the late eminent Professor of Oriental Literature in the University of Edinburgh being the last of the name. It may be well here to premise, that my invention is no portable form of Manby's apparatus whatever, but rests on principles distinctly and essentially different. Manby's invention consists of a barbed shot, fired from a mortar, requiring all the refined manipulations of gunnery to manage successfully the parabolic curve of the projectile. It is applicable to no other form of ordnance, and carries the rope along with it. My invention, on the contrary, possesses the arrow form of the projectile, by which the resistance so formidable in his is materially diminished. It is also applicable to every species of firearms, from even the simplest form, and thus universally effective; moreover, it simply carries with it a cord of sufficient strength of material to be the medium of transport of the rope, which is finally destined to form the line of communication between the stranded vessel and the shore.

Ever since 1817, when my first experiments were made, on the shores of the Isle of Man, near to Mona Castle, I have, at such intervals as my avocations permitted, been engaged in modifying and repeating my experiments, from a conviction of their paramount importance. A set of my apparatus was purchased at Whitby, to be available when required, and the public exhibition already made with it have given great satisfaction. Other sets have also been supplied, and the merit of the invention seemed to be assigned to me with such common consent, as to secure me from any unprincipled attempt to deprive me of my rights. The unprecedented circumstances which have lately transpired, however, prove that I was mistaken in my conclusions, and that there was one individual, at least, who defied all the scrupulous niceties of the inviolability of property.

I ordered a stout gun, with a perfectly cylindrical bore, through Messrs. Ellis & Hardwick, of Sheffield, for the exhibition at Greenwich, last Sept., but was disappointed of it, owing to the illness of the gunmaker. I had just returned from the anniversary meeting of the British Association at Edinburgh, and there was no time for any new arrangement; therefore, rather than disappoint the Lincolnshire Shipwreck Institution, I had on the instant a portion of the barrel of an old blunderbuss cut by Blanch for the purpose. Under these circumstances, the experiments were necessarily exhibited under every disadvantage.

Before I left Hull, I gave Blanch an order for a gun similar to the one of which I had been disappointed, and from the greater length of the barrel, increased charge of gunpowder, &c., told him some slight modifications of the arrow would be found necessary; and after supplying him with arrows and lines, and the pamphlet I had written on the subject, desired him to make a few experiments, at my expense, to prove the gun; and on the 31st Dec. he wrote to me, stating that he had done so—that the experiments were satisfactory, and he only waited my further orders.

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On the 11th March the question was brought before Sir F. Pollock, his Majesty's Attorney-General, when Blanch's application for a patent was immediately and peremptorily dismissed; and had it been a court of judicature, his conduct would not have escaped the severest censure and reprimand.

These are the simple facts connected with an audacious attempt to defraud me of my invention, the fruits of lengthened investigation, and the result of much arduous solicitude, and no inconsiderable pecuniary sacrifice. I believe the case to be without its parallel in the annals of delinquency; and Blanch is (whether he acknowledges it or not) deeply indebted to that forbearance which has thus unsummoned him before a criminal court to answer for his conduct.—J. MURRAY: *Hull*, March 18, 1835.

But as I wish that all my communications should, in some way or other, have a useful feature, either in the correction of what I believe to be error, or tend to practical usefulness, I may add yet more definitely, that the principle of the invention may be described as consisting in the employment of an arrow as my projectile, and thus, by its form, diminishing the resistance opposed to its flight through the atmosphere.

The arrow transports, not immediately the cable, or rope, which is to form the line of communication between the wreck and the shore, but a cord, or hempen line, of sufficient strength to pull the required rope on board, or otherwise on shore from the wreck, as the case may be. The third ingredient in this design is to make these principles available in an inexpensive and portable form, and in cases, or under circumstances, where neither Capt. Manby's apparatus or any other known invention can be employed, as from the life or other boat which might be prevented from communicating with the wreck by the breakers or sandbanks, or the bar at the entrance of a harbour, or sunken rock. The arrow can also be discharged from the projecting ledge of a rock. The line is threaded through an eye, and not far from the point of the arrow.—J. MURRAY: *Portland-place, Hull*.

*Erratum.*—I find that the case referred to, in a former communication, was not in Wales, but in the timber employed in the Coppertons Works at Whitstable, in Kent.

## CONDUCTORS OF ELECTRICITY.

Sir,—I suppose I am not to understand that Dr. Faraday either proposes, or recommends, wood as the material suited for a lightning rod. Green wood, ere its sap is dried up, is a conductor, and so is the living plant. Baked wood is a non-conductor; converted by combustion into charcoal it becomes a conductor; reduced to inorganic ashes, and we have an electric condition.

Lines thread will conduct electricity; but the fibre of flax is unsuited to the conditions of a conductor of lightning. I was the first to propose copper as the best material for a lightning rod, and it infinitely transcends iron in every aspect in which it can be viewed; while there are ample reasons for the rejection of iron altogether. Of course, copper wire—even silver wire—of sufficiently small diameter may be fused by a sufficiently powerful discharge of electricity. No doubt, there are instances wherein the copper bell wire has been fused, and even vapourised by lightning, but never, I believe, throughout its entire extent; and occasional flaws, or oxidation, may in cases have been the cause; but numerous are the instances wherein a

copper bell wire has maintained its integrity throughout, and safely transmitted the electric motor, which has exploded in the bell-pull. I never dreamt of employing a mere bell wire as my lightning conductor.

*Portland-place, Hull, April 8.* J. MURRAY.

*[Erratum.*—In my communication "On Paragons," the letter addressed to the Times should have been "February 26, 1835," not 1819.]

## HARRIS'S CONDUCTORS FOR THE NAVY.

Sir,—I cite the following paragraph from a newspaper, and which had been adduced in evidence of the efficacy of Harris's conductors on ship-board:—"Her Majesty's ship, *Ganges*, was struck by lightning in January last, near Athens. The electric discharge fell in forked streams on the foremast, producing luminous coruscations, or spouts, as the sailors term them, nearly half way down the mast; no damage ensued. The conductors fixed in the spars carried off the great bulk of the discharge, without the least inconvenience—not a rope yarn was damaged."

It would be difficult to conceive of testimony more equivocal or less satisfactory. All that can be said is, that the *Ganges* had a very narrow escape; but as to any protective influence on the part of the conductors, the whole phenomena seem to proclaim their inefficiency. Similar displays of the meteor have been witnessed when the old chain conductors were employed, and in like manner no damage sustained, and yet these are repudiated by common consent. In previous reports the same equivocal testimony is advanced. In one case "little or no damage had occurred." In the sloop, *Racer*, a "portion of the metal at the mast head was fused." The *Hazard* had "her spars saved." I am quite sure, if a ship were properly secured by good lightning conductors, and founded on sound electrical principles, there would be none of these terrible and dangerous displays of lightning, but a silent and unobtrusive discharge, as in the case of St. Paul's, and also St. Peter's church, at Huddersfield, &c., on land.

If the experiment made in the case of the *Orestes* has been correctly stated, it seems one from which no just or unequivocal inference can be drawn in favour of Harris's conductors for the navy. I believe the conductor consists of a "strip of copper, 3 to 4 inches broad, and 1-8th of an inch thick," inlaid in the mast, and affixed by metallic nails, and finally passing through the keelson by a copper bolt into the water. Whether this weakens the mast, as complained of in the dock-yard, I am unable to determine; but strips of brass, not copper, were originally proposed, and, I believe, the idea was then seriously entertained that the conductor should traverse the powder magazine! The conductor in question has been described several years ago as "a bewildering, right-angled, zig-zag process, introducing that very destructive element into a ship by conductors made of strips of copper, inlaid the whole length of her masts, down to her very keelson, and thereby a still more confused and unintelligible process, discharging the same through her frame-work."

I must frankly confess, the "forked streams," and "luminous coruscations," in the case of the *Ganges*, powerfully corroborate the justice of this language. The main body of a good conductor should be composed of a round smooth surface, and formed of a good conducting material. Nothing, in my opinion, can be worse than the edges and angles presented by the "strips" of copper. Every practical electrician knows how readily electricity is dissipated and flies off by edges and angles, and how obstinately it attaches and adheres to rounded and smooth surfaces, such as knobs; and, as in the case of the prime conductor of the electrical machine; a point and edges are essential for its safe and silent receipt; but the homogeneous condition of the meteor should not be disturbed, nor do I think the lightning should be trifled or tampered with by being invited below decks. The expressed opinions of Mr. Martyn Roberts and others, are equally hostile to Sir Snow Harris's conductors, and the convictions of their questionable safety, so far from being weakened are strengthened, by constantly recurring facts, and more matured reflection. Electricity is not with me a theme of yesterday, but the study of thirty years. I do not see why my lightning conductor, which has stood the severe test of twenty years, should not be equally available on ship-board; the simple expedient of a provision of tubes, sliding into each other like those of a telescope, would meet the contingency of the top-mast and top-gallant mast being "struck," or lowered, in the storm. I should have each mast so provided, but I would not continue the conductor below decks to the keelson. I would have it sheathed with gutta percha, from the bottom of the mast, and inlaid in the deck, and passing over the side of the ship into the sea.

It is deeply to be deplored that truth and science should be sacrificed to favoritism—the baneful root of most terrible evils. So serious and important a question should be submitted to the calm and dispassionate judgment of such individuals as have not only well studied the practical details of electrical science, and the laws of electricity, but have minutely observed and considered the phenomena of lightning in its phases and effects. Technical electricity may be studied, and yet the judgment be warped. The advocacy of Admiral Adam and Lord Minto prevailed, and Harris's conductors were employed; but, the pretensions of these individuals to a correct knowledge of the requisites of a good lightning conductor I have yet to learn.—J. MURRAY: *Portland-place, Hull, April 6.*

## THE LIGHTNING-ROD.

Sir,—There is a portion of my lightning-conductor which, though shown in the figure, I have inadvertently omitted to explain, and which renders Sir James Murray's assumptions still more remarkable and unaccountable. I copy *literatim* from the *Description of a New Lightning-Conductor*. London, 1833, p. 40:—"The conductor thus constructed enters the earth at a slight angle, and terminates in a stone trough, which will be supplied with sufficient moisture by the pipe. Here it is split in twain, and its ramifications pass over the edge of the tank into the subsoil." J. MURRAY.

*Portland-place, Hull, April 6.*

*[Erratum.*—Thickness of copper tube should be  $\frac{1}{8}$  inch; diameter within being  $\frac{1}{4}$  inch.]

## EFFECTS OF CARBONIC ACID GAS ON THE HUMAN SYSTEM

TO DR. MURRAY, PORTLAND-PLACE, HULL.

Sir,—Observing, in last week's *Mining Journal*, an article on carbonic acid gas, and believing, from the various valuable communications by you to the public, through the medium of that paper, that it affords you pleasure to impart useful information, may I solicit, on behalf of myself and others, your opinion of the effects of that acid (in case of good spring water highly charged with it being used as a common drink) on the human system in general, and also against sea scurvy, both curative and preventive.

*Easton Coal-Works, near Bristol, April 9.* WILLIAM SIMS.

## TREATIES OF COMMERCE AND PATENT LAWS.

Sir,—The observations which have recently appeared in your excellent paper, under the above title, I have read with attention; and if we were not so much accustomed to hear on all sides of abuses in the administration of our laws—the laws themselves being for the most part good—it would excite no little surprise that those pointed out by you, as prevalent in the practice of the patent law, should constitute so important a part in the long catalogue of legal complaints. Amongst the abuses which you have exposed, I wish at present to refer to only one of them—that is, that supposing 1000 patents to be granted in one year, which I find is quite probable, the enormous sum of 240,000*l.* would be divided annually amongst either sinecurists, or well-paid public servants. This statement is attested to be refuted in your last week's paper, by the respectable patent agent, Mr. F. W. Campin; but I think he will perceive, unless he is a believer himself in the mode of verification approved of by the Attorney-General, in the case of applications for, and specifications of, patents, that some authority and proof are requisite on his part before your readers and the public can disbelieve the allegations set forth by you in the articles above alluded to. It is stated by Mr. Campin that for an English patent, about 62*l.* goes to the public treasury, for a Scotch patent 25*l.*, and for an Irish patent 50*l.*; and he then states it as "not being known that the emoluments of several abolished clerkships of the signet, and other officers, together with the fees paid to Her Majesty, go to the Consolidated Fund."

Now, all this, to say the least of it, is very vague and unsatisfactory, by way of explanation, and coming from a person of Mr. Campin's experience and knowledge; the more so, as it must be supposed to be quite within the power of Mr. Campin to make the whole matter perfectly clear and intelligible, which, since he has volunteered to refute your statements, he must admit that he is fairly bound to do; otherwise, they will remain, as I think they will be found to be, substantially correct.

If Mr. Campin will state what clerkships are abolished, and what fees are taken from officials, we shall know exactly what does go into the treasury, and then either a gross sum can be demanded of the public for a patent in a clear and intelligible manner; or, if necessary, an abatement of that sum be solicited of Parliament in the usual and proper manner.

*Portland-place, Hull, April 9.* A CONSTANT READER.

ELECTRIC ALARM.—We were much pleased, a few days since, by an inspection, at Mr. Whishaw's office, Adelphi, of an ingenious little arrangement of electric apparatus, for giving immediate notice of any attempt by burglars to enter a dwelling, or the outbreak of a fire in any part of a house, the invention of Mr. Woodhouse, of Brighton. For the former purpose, conducting wires are led from every door and window of the house to a case containing the wheels and weight, as simple as the alarm of a common Dutch clock; the catch which takes into the ratchet of the striking wheel is on one end of a lever, the other end of which is placed immediately beneath a cylindrical armature, composed of an alloy of tin and iron, above which is placed a permanent magnet. The armature is held in its place by magnetic attraction, but the wires are so arranged, that the instant a door, or window, is opened in the slightest degree, the electric circuit is completed, the poles of the magnet reversed, and, consequently, the armature is repelled from it, which, falling on the lever, liberates the catch, the weight descends, and the alarm bell continues ringing till run down. On breaking the circuit, the armature again ascends to its place by magnetic attraction. For giving notice in case of fire, a thermometer is placed in any room, or rooms, as may be desired, into the tube of which a fine copper wire is inserted to any degree above which it is not wished the temperature should rise without giving warning—say, 98°. The mercury in the bulb is connected with the opposite pole of the battery; the instant the mercury rises sufficiently high to come in contact with the wire the circuit is completed, and the action above described takes place. The battery arrangement is on Smee's principle, contained in two small bottles, about 4 inches high; and Mr. Whishaw informed us that they will retain their power for six months, or probably longer, without requiring the slightest interference. The simplicity and cheapness of this beautiful little apparatus will, we should imagine, render it much employed in solitary detached houses in the country, as nothing for the purposes mentioned could be more certain and complete.

THE ELECTRIC TELEGRAPH.—At a recent meeting of the Philosophical Society of Glasgow, a Mr. Alexander Mitchell, in a lecture on the electric telegraph, introduced some improvements stated to have been made by him in the general arrangement of the instrument, in the use of only one wire, and in the great facility by which the instrument can be worked. As given in a Glasgow paper, it appears that letters are arranged in a segment in front of the operator, and corresponding ones inscribed on keys similar to those of a piano forte. On pressing down a key, the corresponding letter is immediately pointed to by a needle, a similar movement taking place at every station throughout the circuit. We know not if Mr. Mitchell was the first constructor of this kind of telegraph, but we do know that a similar one was exhibited two years since at the Society of Arts; and we also know that several inventors of telegraphs have been content to use only one wire, employing the earth for the return circuit.

ELECTRIC TELEGRAPHS IN GERMANY.—Two hundred German miles of telegraphic wire are, at the present moment, extended over Austrian territory. Upwards of two hundred more are also in a state of forwardness, and will be completed by the end of June. On the west line, Linz and Salzburg are connected with Kufstein, Innsbruck, Bozen, Verona, Milan, and Venice; on the south, the chief station, Graz, is connected with Laybach, Trieste, Steinbrunn, and Agram; on the north, the line extends from Prague to Lobositz and Bodenbach, connecting them with Saxony. Oderberg is in communication with Prussia, Troppau, and Cracow. The eastern line will extend from Presburg to Waitzen and Pesth. A line, connecting the Imperial Palace of Schonbrunn with the central bureau at Vienna, is in course of construction.

NEW BRICK-MAKING MACHINE.—Mr. Hart, engineer, of Seymour-place, Bryanston-square, is now exhibiting a machine for making bricks, which, besides producing them with greater rapidity than by any previous machine, and at a less cost, possesses the advantage of turning them out in an exceedingly dense and homogeneous form, requiring no great length of time after pressure before they are fit for the kiln. The machine is very powerful, but compact. The clay is placed in a hopper, in a rough state, from whence it passes, in a well kneaded condition, into the brick moulds, which are placed upon an endless chain; here it passes beneath the presser, which reduces the bricks to the proper size, and after this part of the process they are stacked for drying. One horse, two men, and four boys, at a cost of about 1*l.*, can turn out 26,000 perfect bricks, stacked, in 12 hours. The machine is also admirably adapted for compressing peat for manure, or pressing into cakes oil dregs, and other similar substances.

THE RHEIN BRIDGE AT COLOGNE.—The Prussian Minister of Trade and Public Works has issued a public notice inviting the engineers of all nations to send in plans of a fixed bridge at Cologne, to unite the lines of railway between Belgium and France with the great German line to Vienna. Since the time the Romans possessed these provinces no German Government has yet been able to build a stone or other fixed bridge over the Rhine, and the modern railway traffic has to cross the stream by a contrivance that has not been improved for centuries. The Minister states the conditions to be fulfilled in the construction: the river from bank to bank is 1275 feet wide; this space must be crossed by a bridge leaving three openings; the piers are to occupy in all not more than 75 feet, and must be so firmly built as to stand the pressure of the fields of ice that descend the stream on the break-up of great frosts. The bridge must support a tramway for loaded railway waggons, a roadway for ordinary carriages and footpaths. Locomotives will not pass it, nor unbroken trains, and passengers will be taken across from terminus to terminus. The communication, therefore, will still be imperfect, but it is necessary to obtain a certain height above the water to meet the immense rise of the river in floods, and as the termini on the respective banks are on a low level, the ascent from them to the roadway of the bridge will be too short and steep for locomotives. The bridge crosses the river from the north side of the Cologne and Minden station at Deutz, in nearly a straight line, drawn towards the choir of the cathedral immediately opposite. In the design some attention is to be paid to this circumstance, in order that the bridge in exterior effect may be worthy its position. The cost is not to exceed 1,500,000 thalers. The best plan will receive a prize of 250 Fredericks d'or; the second best, 125. All the plans are to be sent in by August next.

THE EXPERIMENTAL BALLOONS.—The last experiment made by Mr. G. Shepherd, C.E., with the message-balloons, which were sent up, on 3d March, from the roof of the Admiralty-buildings, at Whitehall, has been very successful. A letter has just been received at the Admiralty, containing one of the slips, picked up on 7th March by a commercial traveller from Birmingham, who found it, and observed several others of the same kind, at Altona, near Hamburg, a distance of about 450 miles from London. The slips must have dropped from the balloon in its flight over the north of Europe, and its ultimate fate is as yet unascertained. The balloon referred to was made of gold-beater's skin, with an expansive balloon suspended underneath to receive the gas as the expansion took place in the upper regions of the atmosphere, which accounts for the great distance it is known to have travelled. By the aid of similar balloons, Capt. Collinson and Capt. Austin may be able to make known their positions to each other by dispatching them with slips in the Arctic regions, and they may also be able to convey intelligence to Sir John Franklin and his gallant companions, informing them where provisions and friends are waiting or searching for them.

IMPROVED METHOD OF RAISING BOATS ON CANALS.—On the Monkland Canal, at Blackhill, near Glasgow, there is a double series of locks, by which the barges are raised to a perpendicular height of about 100 ft. By this stupendous arrangement of locks so much water is lost, that in dry summers the navigation is stopped, and thousands of pounds in the shape of tolls lost. An improved method is now in course of construction, which, when complete, will be the first of the kind ever employed in this country, although it has been long in use in different parts of America. An inclined plane is now being constructed on the south side of the locks about 1000 ft. in length, with a gradient of 1 in 10, on which will be fixed two lines of rails, similar to those in Morton's patent slip, up which the barges will in future be drawn by steam-power. To prevent any strain on the boats, which generally weigh from 7 to 10 tons empty, and carry from 20 to 30 tons, a great improvement over the American plan will be adopted. This is, instead of bringing them on to a stage whose wheels traverse the rails, they will be floated into large caissons on wheels, and thus remain in their native element during their upward journey, and, when at top, they are again floated into the canal, the caisson descending to take up another load.

HOW AXES ARE MADE.—The process has been greatly simplified within the last two years. The iron is rolled out into bars the proper width and thickness of an axe, and 6, 8, and 10 feet long; it is heated and cut off by a large pair of shears propelled by water power; another workman picks up the piece and places it between a die and punch, and the punch comes down and forces the hole for the handle by punching out a piece. An iron mandril is then inserted into the hole, and it is immediately put under another press, which forms one side of the axe; it then goes into another die, and forms the other side, and is then placed in an upright position, and a chisel comes down and splits the "bit" of the axe ready for the steel; it is then thrown aside. All this is done at one heat, and in less time than it takes to write the *modus operandi*. The blade of the axe is then put in and welded, and passed along to the forger, tempered, and is cast upon the ground to cool. As soon as cool, it is taken up and planed down to an edge by a planing machine, and finished up with the emery wheels—painted, labelled, stamped, and is ready for market.—*American Paper*.

THE BEST MEDICINE FOR COMPLAINTS INCIDENTAL TO FEMALES ARE HOLLOWAY'S PILLS.—Mrs. Tabbot, of Nitcham, informs Professor Holloway that she considers it her bounden duty to acknowledge the astonishing benefit she has derived from taking his pills. At the age of 45 she began to suffer from a general derangement of the system, languor, swollen legs, and other ailments incidental to females; and, notwithstanding the most careful attention to the advice of eminent physicians, her weakness and debility continued to increase, until she adopted another course, and took Holloway's Pills, and this inestimable medicine has restored her to a soundness of health and buoyancy of spirits which she had not enjoyed for some years. Sold by all druggists, and at Professor Holloway's establishment, 241, Strand, London.



[Other proceedings under the Joint-stock Winding-up Act will be found in page 170.]

**SPECIFICATION ENROLLED DURING THE PAST WEEK.**

DESIGNS FOR ARTICLES OF UTILITY REGISTERED.  
W. H. Martin, Burlington Arcade, the pagetina parasol riding whip.

en 16 9—Lambton 17 6—Stewart's 18—Hartlepool 18 6—South Hartlepool 17 6—  
worth 14 6—Old Ducks 16 6—Seymour Tees, 16 9—South Durham 16 6—Tees 18.  
ps at market, 50; sold, 41.

), at their offices, No. 26, Fleet Street, where all communications to be addressed. [April 13]